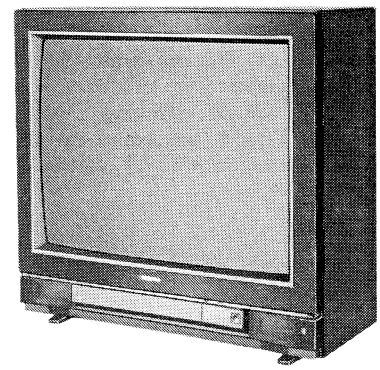
SERVICE DATA
FILE NO. 050-076
SECAM-L, B/G
PAL-B/G
3 SYSTEM

TOSHIBA
COLOUR TELEVISION
329R7F



SPECIFICATIONS

Input Power Rating:	148 watts, AC 220 volts, 50 Hz
Aerial Input Impedance:	75 ohm unbalanced type for VHF and UHF
Receiving Channels:	CCIR L-SECAM Standard: VHF . . . . . channels A, B, C to C_1 and 1 to 6 UHF . . . . . .channels 21 to 69 CCIR B/G-PAL Standard/CCIR B/G-SECAM Standard: VHF . . . . . .channels 2 to 12 UHF . . . . . .channels 21 to 69
Intermediate Frequences:	Pitcute I-F carrier frequency L-System . . . . . 32.7 MHz B/G System (V_H, U) . . . . . 32.7 MHz B/G System (V_L) . . . . . 37.4 MHz Sound I-F carrier frequency L System . . . . . 39.2 MHz B/G System (V_H, U) . . . . . 38.2 MHz B/G System (V_L) . . . . . 31.9 MHz
Chassis Construction:	IC Solid State, Horizontal Chassis
Picture Tube:	32 in. A76JTS90X05(W), 760 mm (measured on diagnal of viewable picture area), 110° deflection
Sound Output:	5.0 watts + 5.0 watts (at 10% harmonic distortion)
Speaker:	50X120mm oval, 2pcs.
Cabinet:	Table type
Dimension:	Height . . . . . 705.5 mm Width . . . . . 740 mm Depth . . . . . 544 mm
Weight (Net):	57.8 kg
Features:	VIDEO and AUDIO input/output terminals, External speaker terminal and Multispatial sound system, Remote control, Off timer, RGB (21 pin) input terminal.

Specifications are subject to change without notice.

Printed in Japan Sep. 1987 (So)

SAFETY INSTRUCTIONS

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND THE "PRODUCT SAFETY NOTICE" INSTRUCTIONS BELOW.

X-RAY RADIATION PRECAUTION

1. The E.H.T. must be checked every time the receiver is serviced to ensure that the C.R.T. does not emit X-ray radiation as result of excessive E.H.T. voltage. The nominal E.H.T. for this receiver is 30 kV at zero beam current (minimum brightness) operating at 220 V a.c. The maximum E.H.T. voltage permissible in any operating circumstances must not exceed 32 kV. When checking the E.H.T., use the 'High Volate Check' procedure on page 15 in this manual using an accurate E.H.T. voltmeter.
2. The only source of X-RAY radiation in this receiver is the C.R.T. To prevent X-ray radiation, the replacement C.R.T. must be identical to the original fitted as specified in the Part List.
3. Some components used in this receiver have safety related characteristics preventing the C.R.T. from emitting X-ray radiation.
   For continued safety, replacement component should only be made after referring the Product Safety Notice below.

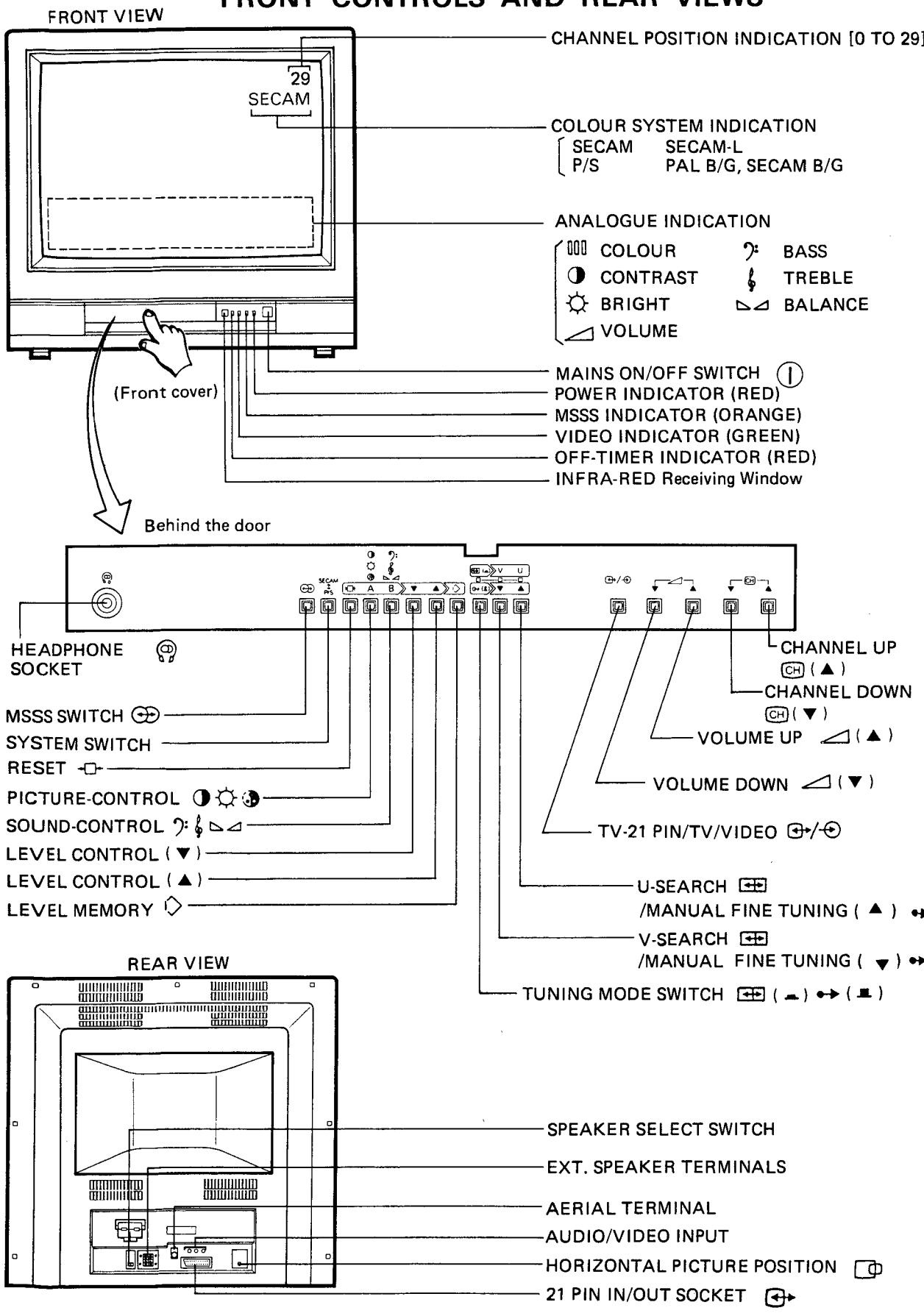
SAFETY PRECAUTION

1. This receiver has a nominal working E.H.T. voltage of 28 kV. Extreme caution should be exercised when working on the receiver with the back removed.
   Do not attempt to service this receiver if you are not conversant with the precautions and procedures for working on high voltage equipment.
   When handling or working on the C.R.T., always discharge the anode to the receiver chassis before removing the anode cap.
   The C.R.T., if broken, will violently expel glass fragments. Use shatter proof goggles and take extreme care while handling.
   Do not hold the C.R.T. by the neck as this is a very dangerous practice.
2. It is essential that to maintain the safety of the customer all cable forms be replaced exactly as supplied from factory.
3. A small part of the chassis used in this receiver is, when operating, at approximately half mains potential at all times. It is therefore essential in the interest of safety that when serving or connecting any test equipment the receiver should be supplied via a suitable isolating transformer of adquate rating.
4. Replace blown fuses within the receiver with the fuse specified in the parts list.
5. When replacing wires or components to terminals or tags, wind the leads around the terminal before soldering. When replacing safety components identified by the internal hazzard symbols on the circuit diagram and parts list, it must be a Toshiba approved type and must be mounted as the original.
6. Keep wires away from high temperature components.

PRODUCT SAFETY NOTICE

Many electrical and mechanical components in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-ray radiation protection afforded by them cannot necessarily be obtained by using replacement components rated at higher voltages or wattage, etc. Components which have these special safety characteristics in this manual and its supplements are identified by the international hazard symbols on the schematic diagram and parts list.
Before replacing any of these components read the parts list in this manual carefully. Substitute replacement components which do not have the same safety characteristics as specified in the parts list may create X-ray radiation.

FRONT CONTROLS AND REAR VIEWS



OUTDOOR AERIAL CONNECTION

- Optimum colour reception requires a good outdoor aerial. If you intend to use a previously installed outdoor aerial, check the aerial and its leads for the effects of weathering. Your Toshiba dealer or service personnel can advise you the best aerial to use in your area.
- In case of using the coaxial cable (75Ω) for UHF/VHF aerial, connect the plug (refer to figure C) into the 75Ω socket as shown in figure A.
- In case of using the twin-lead type feeder (300Ω) for UHF/VHF aerial, trim the lead as shown in figure D and connect the lead to the terminals on the adaptor. Then connect the adaptor to the 75Ω socket as shown in figure B.

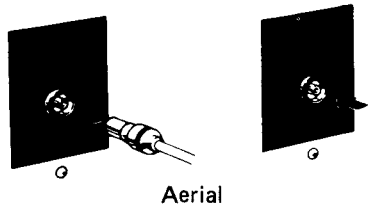


Fig. A

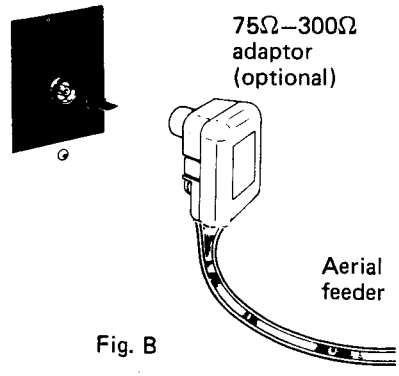


Fig. B

Coaxial cable (75Ω)

Fig. C

Twin-lead type feeder (300Ω)

Fig. D

OPERATING THE RECEIVER

TO SWITCH ON THE RECEIVER

Push in the POWER switch. POWER indicator will be illuminated.

Note: If the power stays in standby mode, push the CH ▲▼ buttons.

TO ADJUST VOLUME (▲▼)

Keep on pressing the VOLUME UP button for increase in volume.

Keep on pressing the VOLUME DOWN button for decrease in volume.

Release the button at your desired volume level.

CHANNEL SELECTION AND TUNING (▲▼) CH

You can select your favourite program by the channel selection keys on the remote control hand unit or "CHANNEL UP/ DOWN" keys on the front of the receiver.

To enjoy the program which is not preset, set the channel by following procedure.

(1) CHANNEL PRESET PROCEDURE

Select the position to be preset by the Channel Position Button (▲ or ▼) on the TV set or the remote control hand unit or by the Direct Position Selector on the remote control hand unit.

To select a position from 10 to 29, press either the "1–" or "2–" button first, and then press one of the buttons from "0" to "9".

For example: 16th. position; Press the "1–" and "6" buttons.
29th. position; Press the "2–" and "9" buttons.

(2) SEARCH

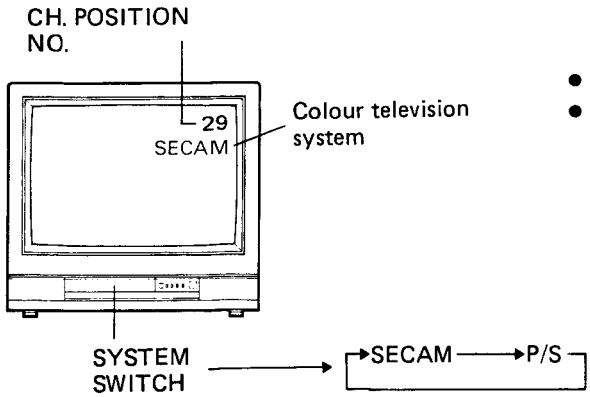
a. When using "SEARCH" key, the system switch should be selected on "SECAM" mode or "P/S" mode.
b. Push on the tuning mode switch. (⇔ (⌁))
c. Push the SEARCH key of channel band to be searched. (UHF or VHF)
d. When television signal is caught, search operation stops and the channel is memorized automatically.
e. During search operation, " >>> " is indicated under the position indication.
f. When SEARCH gets to the END of VHF or UHF, the display " >>> " will flash.

(3) MFT (Manual Fine Tuning)
a. Push off the tuning mode switch. (●→(▲))
b. Tune the fine picture by MFT button. (▲ or ▼)

SECAM-L	(CHANNEL Range)
VHF Band I VHF Band III UHF Band IV/V TV CABLE	B–C 1–6 21–69 B–Q (12 MHz STEP) 70–86 (10.5 MHz STEP)
PAL B/G, SECAM B/G	(CHANNEL Range)
VHF Band I VHF Band III UHF Band IV/V	E2–E4 E5–E12 21–69

COLOUR SYSTEM SELECTION SWITCH OPERATION

This TV receiver can receive 3 systems.



- SECAM . . . . . SECAM-L signal can be received.
- P/S . . . . . PAL B/G, SECAM B/G signal can be received.

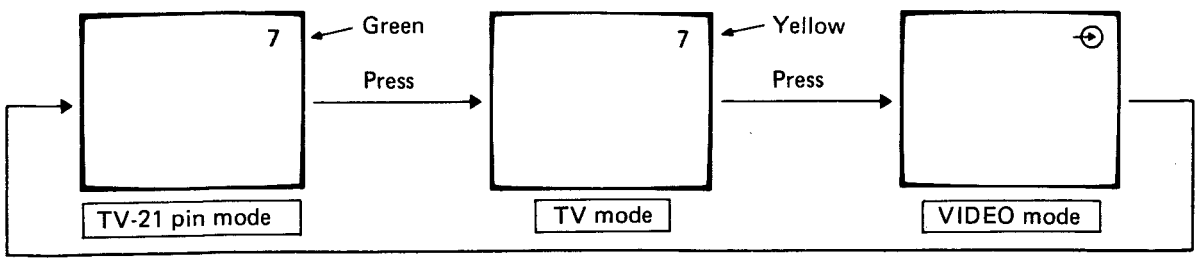
MSSS (Multi Spatial Sound System) Button (⊕⊕)

Push on the MSSS button and the MSSS indicator will be illuminated. Now you can enjoy an enhanced dimension in the sound.

Push off the MSSS button, and the sound returns to the original state.

TV-21 PIN/TV/VIDEO Button (⊡→/→⊙)

The A/V source is selected in sequence as shown in the following example.



TV-21 PIN Mode: Channel number displayed in green.
Normal TV reception, but receiver will automatically switch to accessory if one is connected to the 21-pin Peri socket and switched on.

TV Mode: Channel number displayed in yellow.
TV reception only possible. Accessories connected to the 21-pin Peri socket are excluded.

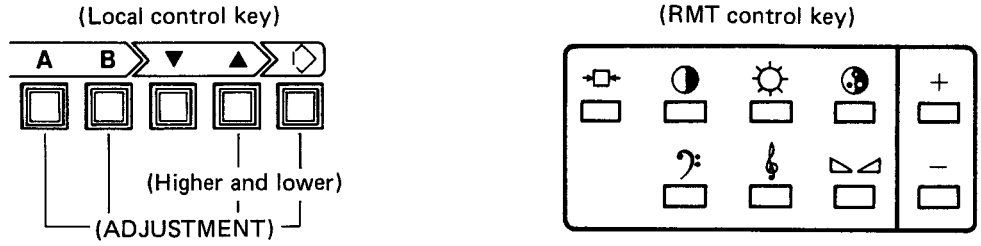
VIDEO Mode: VIDEO symbol →⊙ is displayed in green.
In this mode the 21-pin Peri socket and AUDIO/VIDEO Terminals are exclusively available to connected accessories. No TV reception is possible in this mode.

Note: Press the power switch or one of the channel buttons to return to "TV-21 PIN". (Except when the television is in TV mode.)

CONTROL ADJUSTMENTS

Use the control keys for picture and sound as indicated below. The keys are located on both the television and the remote controller.

(1) Control key

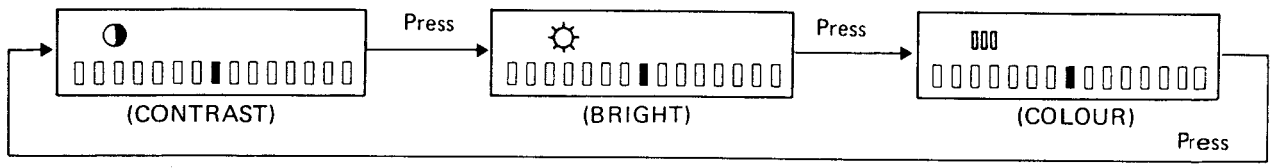


(2) Function Selection

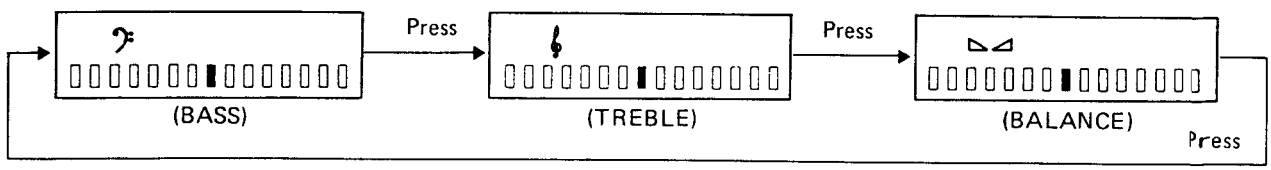
(Local)

The picture control key (A) and the sound control key (B) on the television allow to adjust contrast, brightness, colour, bass, treble, and balance in the order indicated below.

(A) PICTURE CONTROL KEY



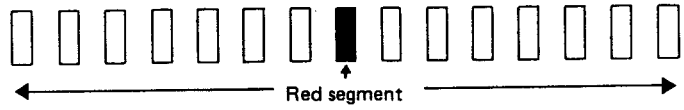
(B) SOUND CONTROL KEY



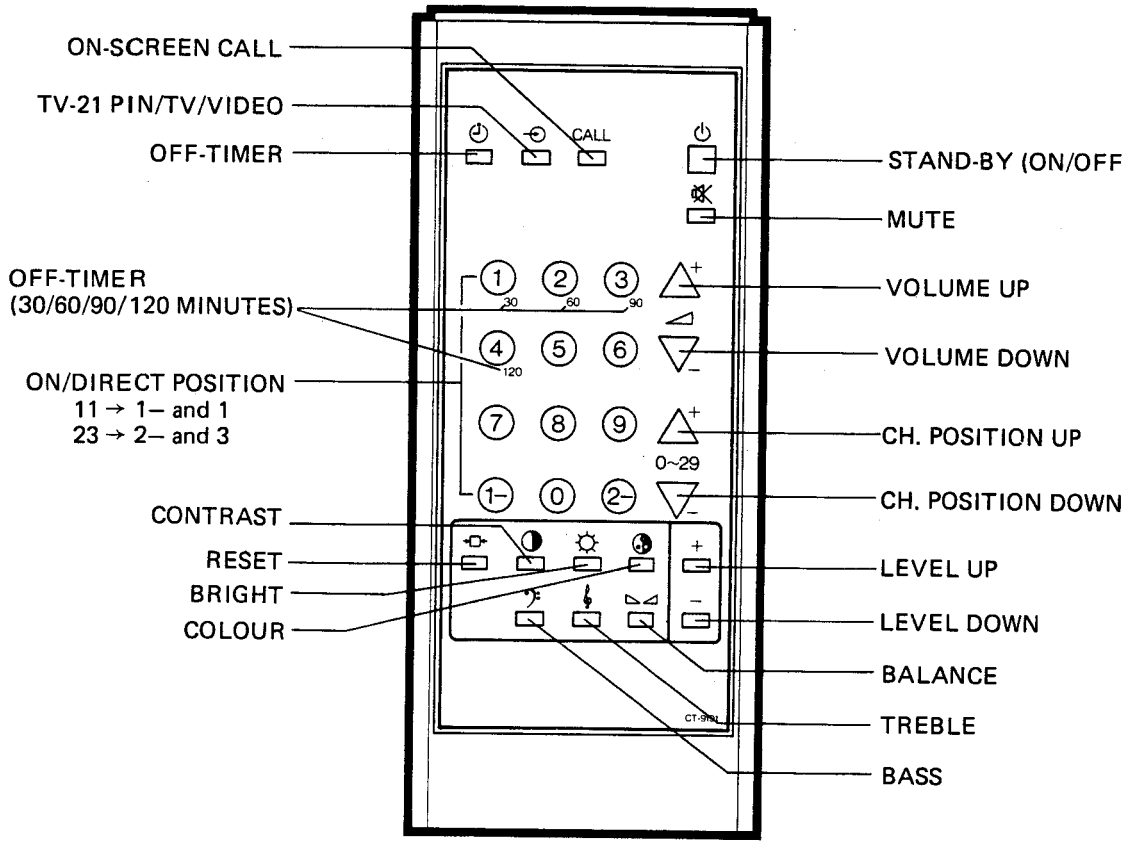
The keys on the remote controller command the selected functions directly.

(3) Adjustment

1. The level control keys (▲ or ▼) are common to the functions. These keys work only while the selected function is displayed. (for 4 sec.)
2. Above display will disappear if no additional pressing of CONTROL or LEVEL (▲ / ▼) key is done within 4 seconds.
3. The last adjusted value will be stored into memory IC when LEVEL (▲ or ▼) key is released.
4. The RESET (-□-) key resets the value corresponding to picture control functions, such as CONTRAST, BRIGHT and COLOUR, to the value which is previously programmed by customers.
   In order to program the reset value, press the MEMORY (◇) key after adjusting each function.
5. Adjustment steps and indication
   Each function can be adjusted with 64 steps and it's approx. adjusted value is displayed with 15 stpes.

	FUNCTION	ON-SCREEN COLOR BAR DISPLAY	
			
		CONTROL DOWN ▲ Button (The red segment moves left)	CONTROL UP ▲ Button (The red segment moves right)
PICTURE-CONTROL Button	CONTRAST ◑	Week	Strong
	BRIGHT ☼	Dark	Light
	COLOR ▯▯▯	Pale	Deep
SOUND-CONTROL Button	BASS 𝄢	Low tones are weakened	Low tones are enhanced
	TREBLE 𝄞	High tones are weakened	High tones are enchanced
	BALANCE ◺◿	Lowers sound from the right speaker	Lowers sound from the left speaker

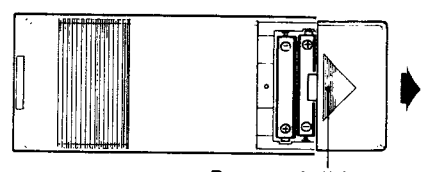
REMOTE CONTROL HAND UNIT



Before operating

INSTALLING THE BATTERIES

1. Remove the battery cover.
2. Insert two 1.5V AAA batteries and align the polarities + or – on the batteries and the compartment.
3. Close the battery cover.

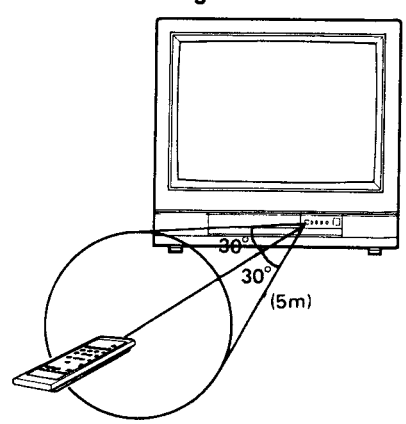


Press and slide to open.

TIPS FOR REMOTE OPERATION

- If intermittent remote control operation occurs, replace the batteries according to "INSTALLING THE BATTERIES."
- The battery life should be about a year under normal use.
- When the Remote Control Hand Unit is not used for a long period of time or when the batteries are worn out, take out the batteries to prevent liquid leak.
- Do not throw the batteries into a fire. Dispose of used batteries in the specified places.
- Take care not to drop, dampen, disassemble the Remote Control Hand Unit.

Effective Range



REMOTE OPERATION

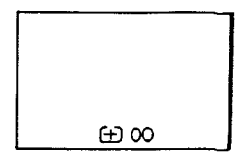
Before using the Remote Control Hand Unit, push the power switch on the receiver to turn the TV set on.

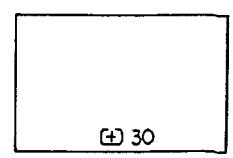
1. STAND-BY "ON/OFF" Button (⏻)
   To switch on, push the button. To switch off, push the button again.
2. ON/DIRECT POSITION Selector
   To switch the TV set "ON", press any of the position buttons, and the program in that position comes out
3. VOLUME UP or DOWN Button (◿)
   [+] Continuous press increases Volume gradually.
   [-] Continuous press decreases Volume gradually.
   Release the button at your desired volume.
4. BRIGHTNESS Button (☼)
   Press the BRIGHTNESS ☼ button.
   [+] Continuous press increases Brightness gradually.
   [-] Continuous press decreases Brightness gradually.
5. COLOUR Button (◔)
   Press the COLOUR ◔ button.
   [+] Continuous press increases Colour gradually.
   [-] Continuous press decreases Colour gradually.
6. CONTRAST Button (◑)
   Press the CONTRAST ◑ button.
   [+] Continuous press increases Contrast gradually.
   [-] Continuous press decreases Contrast gradually.
7. CALL Button
   The selected CH. No. and Receiving Colour System are indicated on the TV screen when the "CALL" button is pressed.
   The indication disappears by the second press.
8. RESET Button (↩□↩)
   By pushing the RESET button, the levels of the colour, the brightness and contrast return to the original levels.
9. TV-21 PIN/TV/VIDEO Button (⊖)
   The function of this button is exactly the same as "TV-21 PIN/TV/VIDEO SWITCH" described on page 5.
10. MUTE Button (🔇)
    Pushing the button stops the sound temporarily.
    Pushing the button again returns the sound to the volume at which it was set immediately before the muting.
    Using when the telephone rings.
11. OFF-TIMER (⏲)
    OFF-TIMER function is incorporated in new control system. Four kinds of setting time, such as 30, 60, 90 and 120 min are available and its remaining time before turning off a set can be displayed on the screen.
    OFF-TIMER is only operated with Remote Control Hand Unit.
    For example, if you wish to switch the TV set off after 30 minutes:
    1. Press TIMER ⏲ Button.
       The TIMER mode is displayed on the screen.

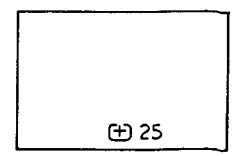
    2. Press "①$_{30}$" Button.
       "⏲ 30" will appear on the screen and OFF-TIMER INDICATOR lights up.

    3. Press TIMER Button again.
       The display of TIMER mode will disappear.

    4. When you want to know the remaining time before tuning off a set, press TIMER button. Then the remaining time will show up on the screen.



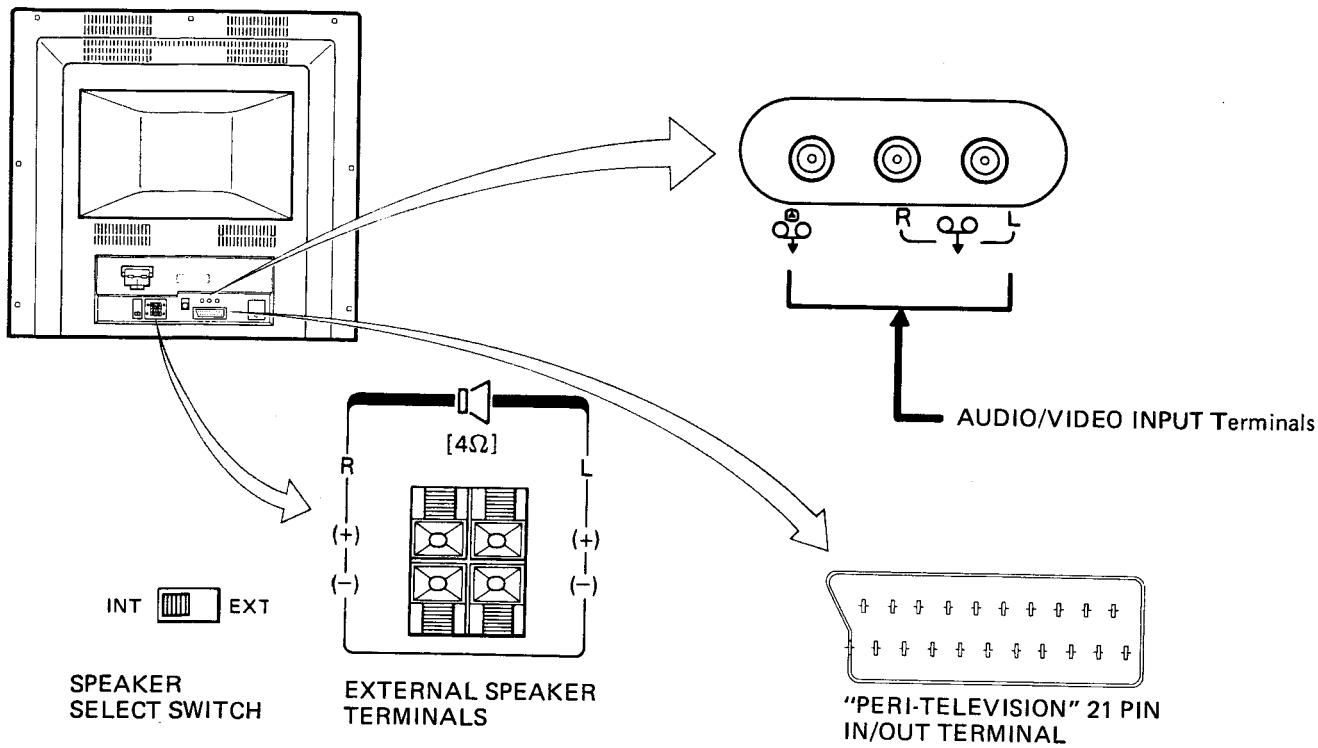




Note: To cancel the timer operation, ① press TIMER button ② Press RESET button.
Timer operation is also cancelled by turning the power off.

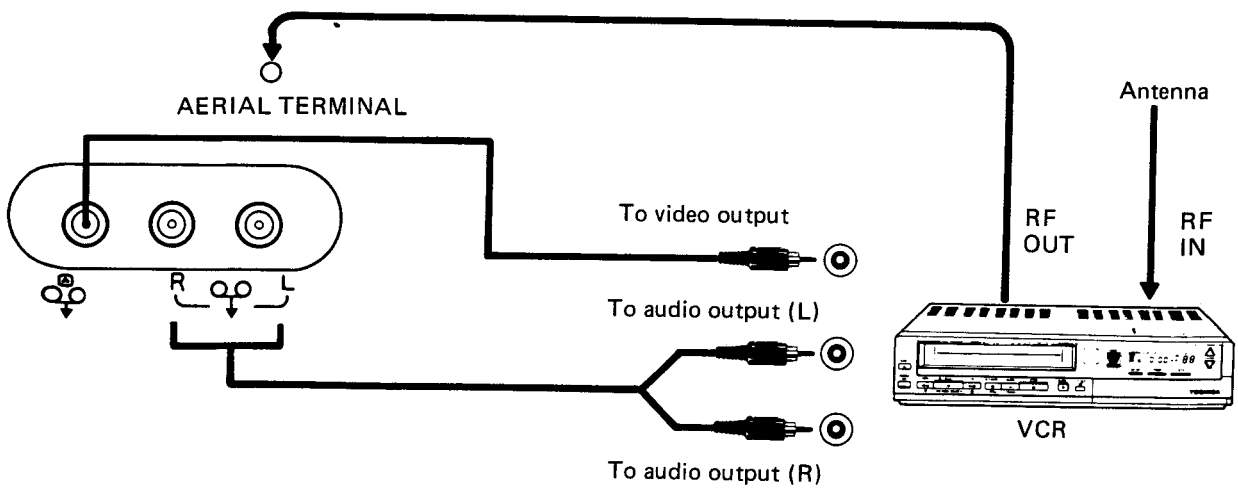
CONNECTING THE EXTERNAL EQUIPMENT

This TV set is equipped with AUDIO/VIDEO INPUT Terminals, 21-PIN IN/OUT Socket and EXTERNAL SPEAKER TERMINALS for your desired equipment to be connected.



USING THE AUDIO/VIDEO INPUT TERMINALS

Connect to the audio and video output terminals of a VCR, video disk player, etc. for playback of video material. The material being played back on the video equipment can be viewed on the TV screen.



OPERATION (playback)

1. Select "VIDEO" mode by pressing the TV-21 PIN/TV/VIDEO button on the TV set or the Remote Control Hand Unit.
2. Set the VCR to playback mode.

Note: ●When using monaural sound equipment, connect its cord to the Left/Mono jack. Identical sound will be heard from both left and right speakers.

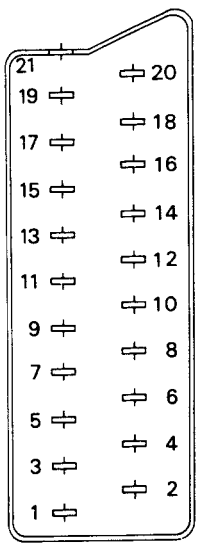
●The owner's manual of the equipment connected should also be read.

PERI-TELEVISION 21-PIN IN/OUT Socket (⊖→)

There is located on the rear cover a "Peri" socket which may be used for a multitude of purposes as follows:

Audio (Mono) input from radio, tape recorders, etc.
Audio (Mono) output to Hi-Fi equipment.
Video (Composite) input from cameras, games and recorders.
Video (Composite) output to video recorder or monitor.
R.G.B. input from cameras, games, computers, etc.

Also on rear panel there is a control marked [ ] this may be used to move picture left to right or right to left whichever may be necessary when using computer peripherals. When using "Peri" socket for the above purposes the TV-21 PIN/TV/VIDEO switch should be placed in "TV-21 PIN" mode.



1.	Audio Out (R)	100mVrms ±3dB
2.	Audio In (R)	100mVrms ±3dB
3.	Audio Out (L)	100mVrms ±3dB
4.	Audio Earth	
5.	Blue Earth	
6.	Audio In (L)	100mVrms ±3dB
7.	Blue In	1Vp-p ±3dB
8.	TV/Video Switch	TV: 0-1V, VIDEO: 10-12V
9.	Green Earth	
10.	NC	
11.	Green In	1Vp-p ±3dB
12.	NC	
13.	Red Earth	
14.	NC	
15.	Red In	1Vp-p ±3dB
16.	Rapid Blanding switching	TV: 0-0.4V, RGB:1-3V
17.	Video Earth	
18.	Rapid Blanking Earth	1Vp-p ±6dB – 3dB
19.	Video Out	1Vp-p ±3dB
20.	Video In	
21.	Shield Earth	

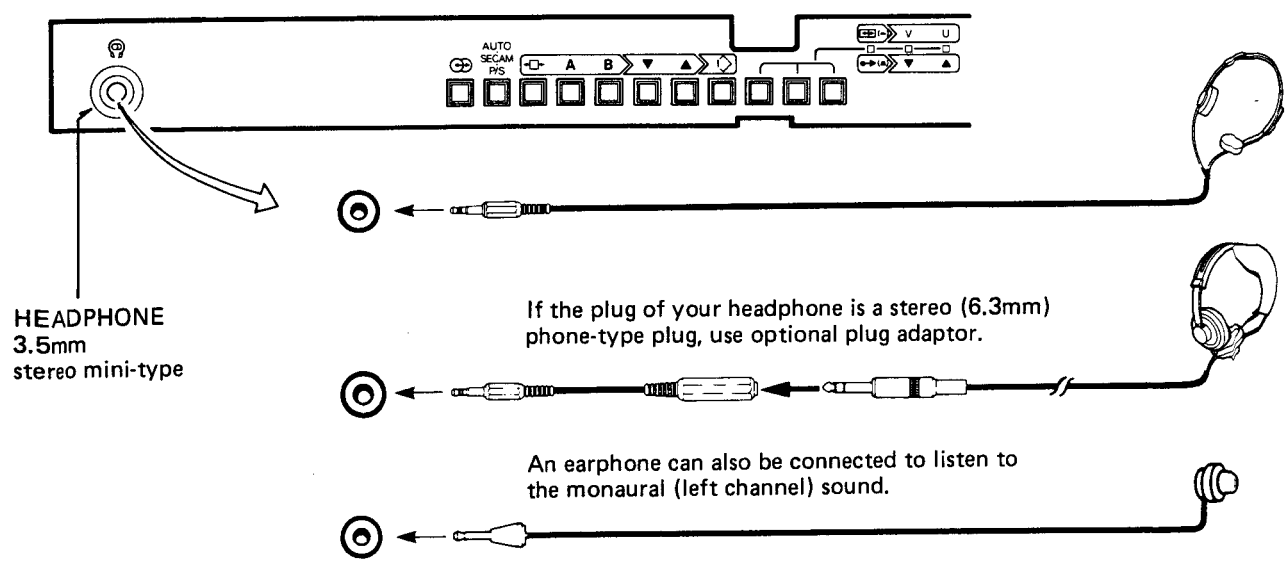
If TV-21 PIN/TV/VIDEO switch is in "TV-21 PIN" mode and a +VE voltage is applied to Pin 8 then TV is switched to video automatically.

If TV-21 PIN/TV/VIDEO Switch is in "TV-21 PIN" mode or "VIDEO" mode and a +VE voltage is applied to Pin 16 then TV is set to receive RGB input.

For guidance in using 21 pin 'PERI' socket please consult your local Toshiba dealer.

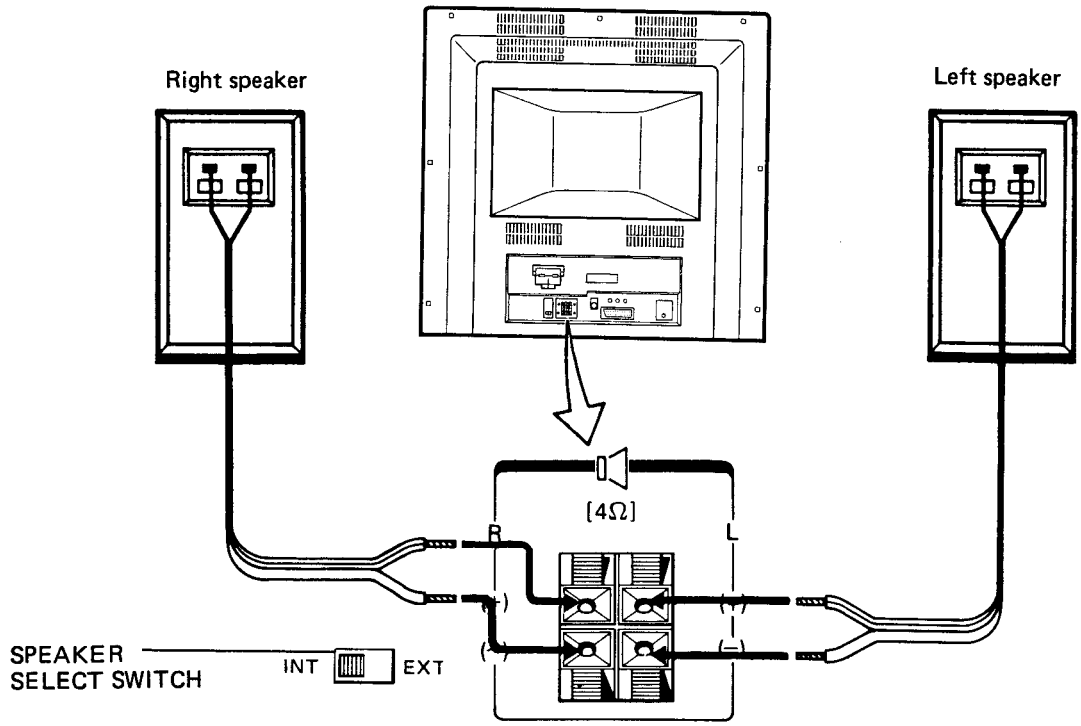
USE OF HEADPHONE

For private listening, connect a headphone (optional) to the HEADPHONE jack.
The sound from the speakers will be cut off automatically.

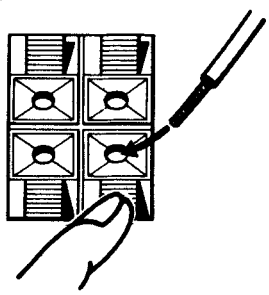

AUTO SECAM P/S
A
B
V
U
HEADPHONE
3.5mm
stereo mini-type
If the plug of your headphone is a stereo (6.3mm) phone-type plug, use optional plug adaptor.
An earphone can also be connected to listen to the monaural (left channel) sound.

CONNECTING EXTERNAL SPEAKERS

You can also enjoy sound by connecting a HI-FI speaker system to the external speaker terminals on this TV. Before connecting the external speakers, turn the TV set off.

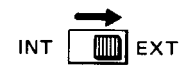


1 Connect speaker leads



While pressing the button, insert the wire into the hole, then release the button.
Pull firmly on the connection to make sure it is secure.
Make sure connection of he wire is proper (R·L and ⊕ · ⊖).

2 Set the SPEAKER SELECT Switch

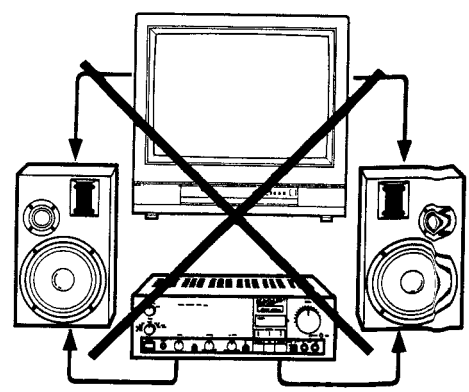


Switch it to "EXT" side (right).
The built-in speaker sound is disconnected.

Note:

- Do not connect two sound sources to the same speaker system.
  This may damage the TV. See the right figure.
- Use only external speakers with an impedance rating of 4 ohms and input power 5 watts or more.

- EXTERNAL speaker terminal
- Impedance/4 ohms



CHASSIS TOP VIEW

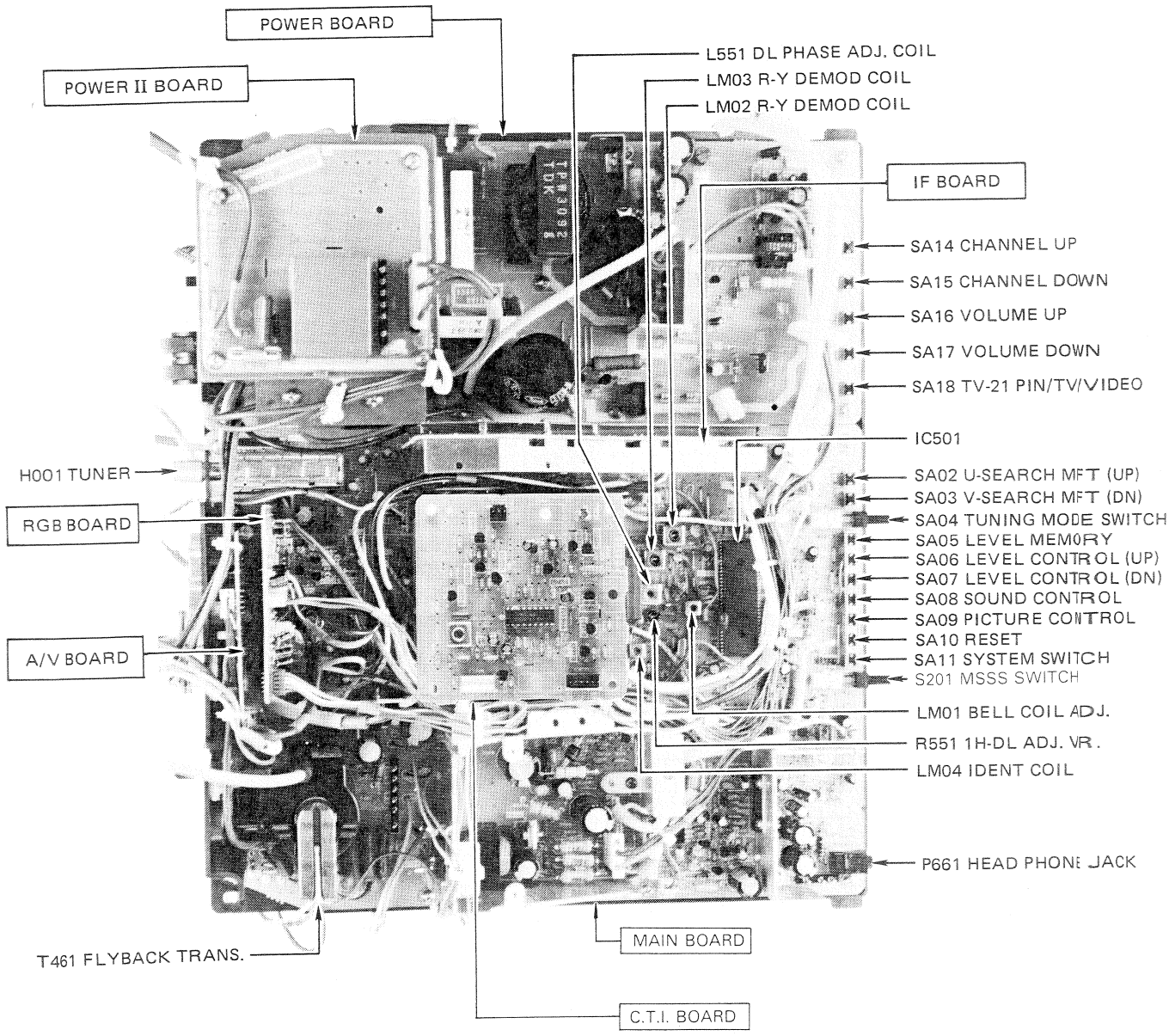


Figure 1. Chassis Top View

CHASSIS REAR VIEW

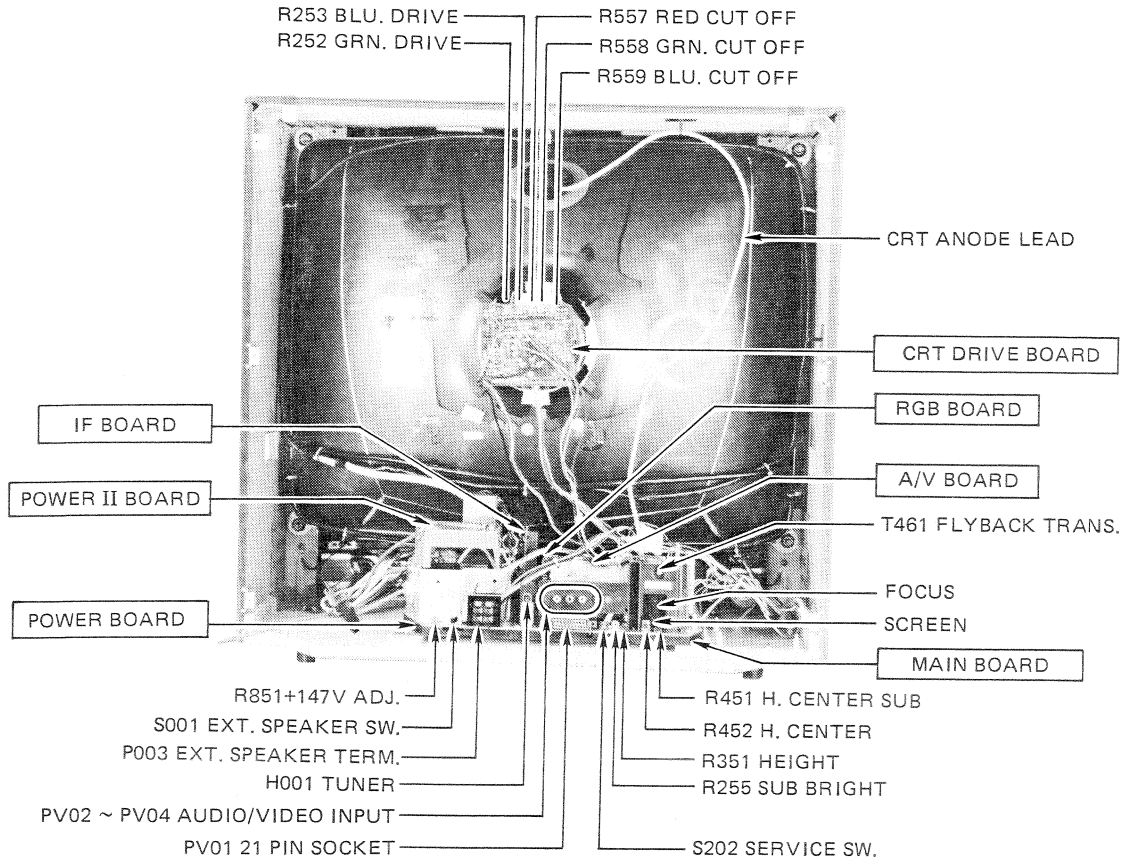


Figure 2. Chassis Rear View

P.C. BOARD TOP VIEW

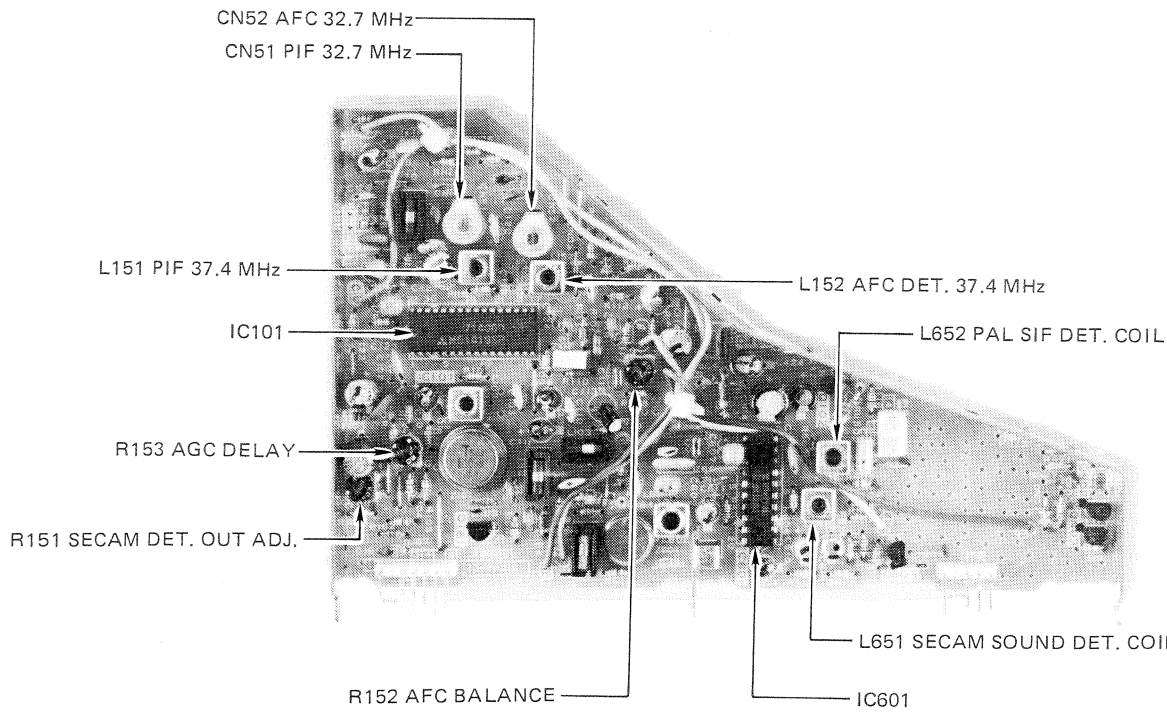


Figure 3. IF Board

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.

INSTALLATION AND SERVICE ADJUSTMENTS

GENERAL INFORMATIONS

All adjustments are thoroughly checked and corrected when the receiver leaves the factory. Therefore the receiver should operate normally and produce proper colour and B/W pictures upon installation. However, several minor adjustments may be required depending on the particular location in which the receiver is operated.
This receiver is shipped completely in cardboard carton. Carefully draw out the receiver from the carton and remove all packing materials.
Plug the power cord into a convenient 220 volts 50 Hz AC two pin power outlet. Turn the receiver ON.
Check and adjust all the customer controls such as BRIGHTNESS, CONTRAST and COLOUR Controls to obtain natural colour or B/W picture.

AUTOMATIC DEGAUSSING

A degaussing coil is mounted around the picture tube so that external degaussing after moving the receiver is normally unnecessary, providing the receiver is properly degaussed upon installation. The degaussing coil operates for about 1 second after the power to the receiver is switched ON. If the set is moved or faced in a different direction, the power switch must be switched off at least 10 minutes in order that the automatic degaussing circuit operates properly.
Should the chassis or parts of the cabinet become magnetized to cause poor colour purity, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube, the sides and front of the receiver and slowly withdraw the coil to a distance of about 2 m before disconnecting it from AC source. If colour shading still persists, perform the COLOUR PURITY ADJUSTMENT and CONVERGENCE ADJUSTMENTS procedures, as mentioned later.

+147 VOLT POWER SUPPLY ADJUSTMENT (R851)

CAUTION: +B voltage closely relates to the high voltage. To prevent hazardous X-RAY RADIATION, the +B voltage must be properly adjusted to +147 volts.

1. Tune in an active channel. Adjust the BRIGHTNESS and CONTRAST Controls for normal picture.
2. Check that the AC power Line voltage is normal. (AC 220 volts, 50 Hz).
3. Connect a VTVM between Pin 28 (+147V) on POWER Board and chassis ground.
4. Adjust the +B ADJ. (R851) on POWER Board for +147 volts reading. Remove the VTVM.

HIGH VOLTAGE CHECK

CAUTION: There is no HIGH VOLTAGE ADJUSTMENT on this chassis.

1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST Controls to minimum (zero beam current).
3. High voltage will be measured below 32 kV.
4. Rotate the BRIGHTNESS Control to both extremes to be sure the high voltage does not exceed the limit of 32 kV under any conditions.

HEIGHT ADJUSTMENT

HEIGHT Control (R351) on MAIN Board changes the size of the picture or pattern, having an equal effect on the top and bottom. Make final adjustment to overscan the mask 2 cm at top and bottom.

HORIZONTAL CENTER ADJUSTMENT

1. Receive the WG PHILIPS pattern.
2. Set the contrast and colour to minimum, and the brightness to maximum.
3. Adjust H. CENTER USER Control (R452) to the click (center) position.
4. Adjust H. CENTER SUB Control (R451) so the pattern center can be located at the screen center.

PICTURE WIDTH AND DISTORTION ADJUSTMENT (Width, Pincushion Distortion, Trapezoid Distortion)

1. Perform this adjustment after +B and H. CENTER adjustment are completed.
2. Receive the WG PHILIPS pattern.
3. Set the contrast and colour to minimum, and the brightness to maximum.
4. Adjust H. WIDTH Control (R358) for the horizontal width so that the white flags on left and right of the pattern are just hidden.
5. Adjust PINCUSHION CORRECTION Control (R359) to correct the vertical line on left and right straight.
6. Adjust TRAPEZOID CORRECTION Control (R356) to correct the trapezoid distortion.
7. Readjust H. WIDTH control for the precision.

FOCUS ADJUSTMENT

Adjust FOCUS Control on FLYBACK TRANS. (T461) for well defined scanning lines in the centre area on the screen.

DELAYED R-F AGC ADJUSTMENT

1. Tune the set in the strongest station in your area.
2. Turn AGC DELAY Control (R153) on IF Board to fully counterclockwise position.
3. Adjust AGC DELAY Control clockwise until noise (snow) disappears on the screen.

AFC (Automatic Frequency Control) FIELD ALIGNMENT

1. Tune the set to an active channel and adjust fine tuning for best picture with MFT UP, DOWN buttons.
2. To activate AFC, temporarily tune in the next active channel with SEARCH button and return to the previous channel.
3. Adjust L152 for the best turned picture.
4. Detune to higher or lower side with MFT button. Then temporarily change to the next active channel with SEARCH button, and return to the previous channel to check for the best tuned picture.

BELL COIL (LM01) ADJUSTMENT

1. Receive SECAM colour bar signal.
2. Connect the synchroscope to the terminal Pin 2 of LM02.
3. Adjust LM01 for the flat level of amplitude in each colour bar waveform on the scope. (See figure 4.)

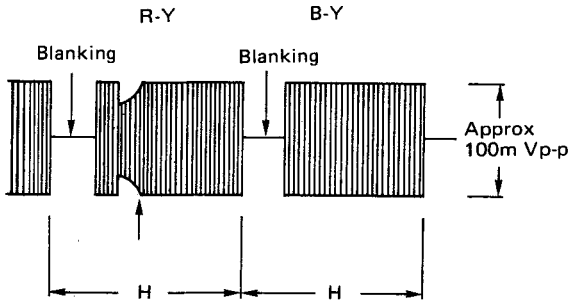


Figure 4.

IDENT COIL (LM04) ADJUSTMENT

1. Receive SECAM colour bar signal.
2. Connect the DC voltmeter (Digital Voltmeter) to the pin 23 of IC501.
3. Adjust LM04 for the maximum indication (approx. DC10V) on the meter.

B-Y, R-Y DEMOD COIL (LM02, LM03) ADJUSTMENT

1. Receiver SECAM colour bar signal.
2. Set the COLOUR, BRIGHTNESS and CONTRAST Controls free.
3. Connect the synchroscope to the pin 60 of IC501.
4. Adjust LM02 so that the white level in picture part reaches to the vertical retrace line. (See figure 5.)
5. Then change the connection of synchroscope from the pin 60 to the pin 62 of IC501.
6. Adjust LM03 so that the white level in picture part reaches to the vertical retrace line. (See figure 6.)

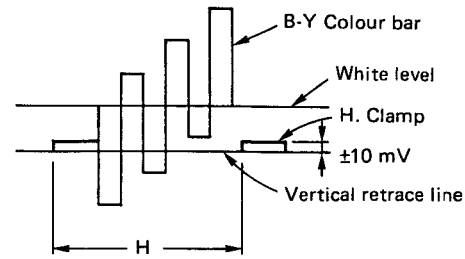


Figure 5.

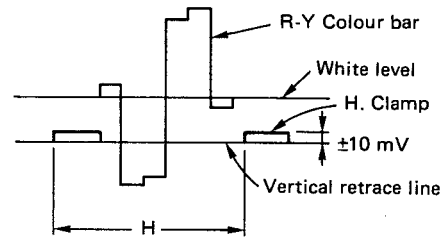


Figure 6.

PAL MATRIX ADJUSTMENT

1. Turn in the colour programme of Philips pattern.
2. Set the COLOUR Control VR, to obtain the proper colour.
3. If the PAL MATRIX adjustment is incorrect, the Venetian Blind would appear in the colour bars area. This case needs the adjustment.
4. At the first, adjust DL PHASE ADJ. Coil (L551) to minimize the Venetian Blind.
5. Next adjust 1H-DL ADJ, VR (R551) to minimize the Blind.
6. If the Venetian Blind still remains, adjust 1H-DL PHASE ADJ. Coil (L551) to minimize the Blind again.
7. Repeat the item 5 and 6 procedures, adjust the R551 and L551 until the Blind does not appear.

CRT GREY SCALE ADJUSTMENT

1. Tune in an active channel.
2. Turn the SCREEN Control (on T461) fully counter clockwise.
3. By rotating the RED, GREEN and BLUE CUT OFF Controls (R557 R558, R559) clockwise from the minimum.
4. Set the GREEN and BLUE DRIVE Controls (R252, R253) to the mid position
5. Set the SERVICE SW. (S202) in the H. line position.
6. Short temporarily Terminal P590 on the CRT DRIVE Board.
7. Set the CONTRAST, COLOUR Controls to minimum and BRIGHTNESS Control to centre position.
8. Rotate the SCREEN Control gradually clockwise until the first line appears slightly on the screen. Then turn fully counterclockwise the two CUT OFF Controls corresponding to the colours of the first and the second horizontal lines to eliminate the lines.
9. Rotate the SCREEN Control gradually clockeise until the first horizontal line of a colour (RED, GREEN or BLUE) appears slightly on the screen.
   Set the SCREEN Control to this position.
   At the base of the colour, rotate the remaining two CUT OFF Controls gradually clockwise until the horizontal lines of each colour appear slightly on the screen.
10. Open the terminal P590 on the CRT DRIVE Board.
11. Adjust the CUT OFF Controls to obtain the slightly lighted horizontal lines in the same levels of three colours (RED, GREEN and BLUE).
    The lines may look like white if the CUT OFF Controls are adjusted properly.
12. Return the SERVICE SW. (S202) in the Receiving position.
13. Set the BRIGHTNESS Control to the maximum and COLOUR Control to the minimum.
14. Adjust the BLUE and GREEN DRIVE Controls (R252/R253) to obtain proper white-balanced picture in high light areas.
15. Set the BRIGHTNESS and CONTRAST Controls to obtain dark grey raster. Then check the white balance in low brightness. If the white balance is not proper, retouch the CUT OFF Controls and DRIVE Controls to obtain a good white balance in both low and high light areas

SUB-BRIGHTNESS ADJUSTMENT

1. Tune in a colour programme.
2. Set the CONTRAST Control to the minimum and the BRIGHTNESS Control to the centre.
3. Set the COLOUR Control to the minimum.
4. Set the SUB-BRIGHT. Control (R255) to the centre and leave the receiver for five minutes in this state.
5. Watching the picture well, adjust the SUB-BRIGHT. Control in the position where the picture does not show evidence of blooming in high bright area and not appear too dark in low bright portion.
6. Check the proper picture variation by rotating the CONTRAST and BRIGHTNESS Controls to both extremes.
7. If the picture does not appear dark with the CONTRAST and BRIGHTNESS Controls turned to the minimum, or not appear bright with the controls turned to the maximum, adjust the SUB-BRIGHT. Control again for the acceptable picture.

PICTURE I-F SWEEP ALIGNMENT

GENERAL . . . . . Refer to Figure 7 for test equipment connection

PRELIMINARY STEPS . . . . . 1. Disconnect the solder link SL-1 (◀▶ see Figure 7) on the foil side of the MAIN Board.
2. Supply +12 volts to pin 3 of P102 on the IF Board.
3. Supply +5 volts to pin 9 of P103 on the IF Board to reduce the voltage at pin 30 of IC101 to below 1 volt.
4. Turn AGC DELAY Control (R153) on the IF Board fully clockwise.

SWEEP/MARKER/GENERATOR . . . Connect to point ⓓ as shown in Figure 11 on the IF Board. Set to 30 ~ 40 MHz sweep with signal level of 75 ~ 85 dBμ.

OSCILLOSCOPE . . . . . Connect with direct probe to pin 31 of IC101 on the IF Board through 100 kohm resistor.

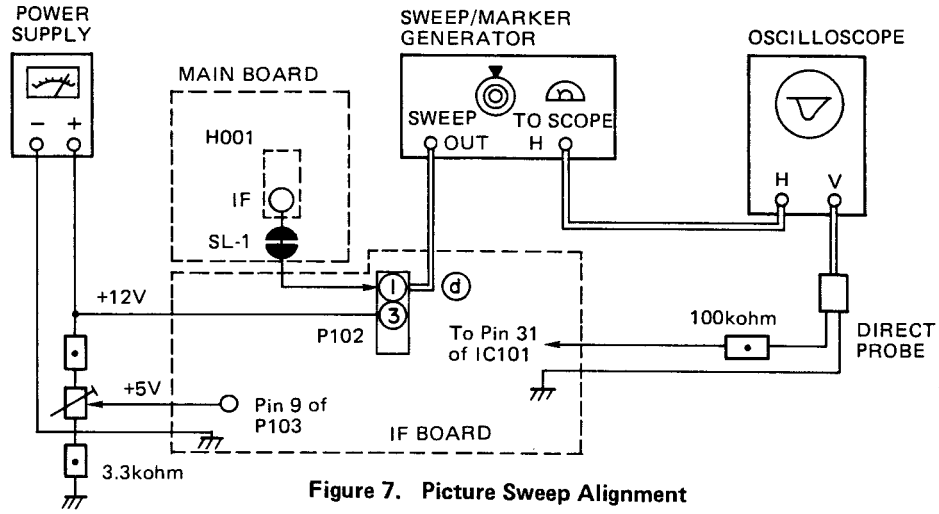


Figure 7. Picture Sweep Alignment

STEP	SWEEP/MARKER GENERATOR	ADJUST	REMARKS
1. Detector Coil (L151)	37.4 MHz Marker "ON"	L151	• Short the junction of RN24 and RN26 on the IF Board to ground. • Supply +3 to +6 volts to pin 4 of IC101 to set the output level for 0.4 Vp-p on the scope. • Adjust L151 so that the marker position (37.4 MHz) on the response can lower to minimum. (See Figure 8.) • Remove the short of the junction of RN24 and RN26. • After completing CN51 adjustment, repeat this step again.
2. Detector Capacitor (CN51)	32.7 MHz Marker "ON"	CN51	• Supply +3 to +6 volts to pin 4 of IC101 to set the detection output for 0.4 Vp-p on the scope. • Adjust CN51 so that the marker position (32.7 MHz) on the response can lower to minimum. (See Figure 8.) • After completing L151 adjustment, repeat the step again.
After completing the above steps, disconnect the equipment and re-solder the links switch on the receiver, and adjust the AGC Delay control (R153) following DELAYED RF AGC ADJUSTMENTS.			

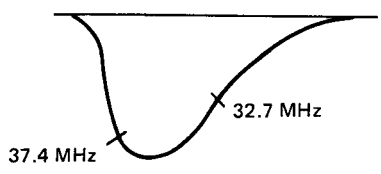


Figure 8. Magnified Response Curve

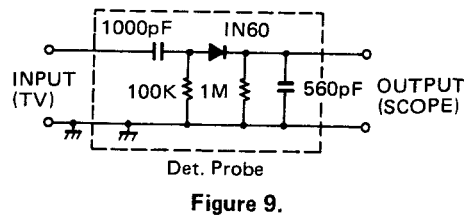


Figure 9.

AFC ALIGNMENT

GENERAL . . . . . Refer to Figure 10 for test equipment connection.

PRELIMINARY STEPS . . . . . 1. Disconnect the solder links SL-1, SL-2 (-◐- See Figure 10) on the foil side of the MAIN Board.
2. Supply +12 volts to pin 3 of P102 on the IF Board. (See Figure 10.)
3. Supply +5 volts to pin 9 of P103 on the IF Board to reduce the voltage at pin 30 of IC101 on IF Board (See Figure 10) to below 1 volts.
4. Turn AGC DELAY Control (R153) on the IF Board fully clockwise.

DVM . . . . . Connect to pin 4 of P102 and ground.

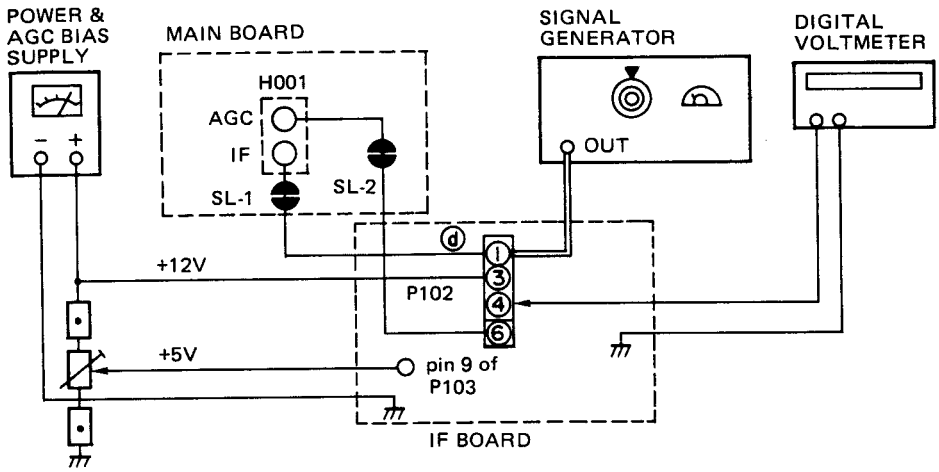


Figure 10. AFC Alignment

STEP	SIGNAL GENERATOR	ADJUST	REMARKS
1. AFC Balance (R152)	NO SIGNAL	R152	●Short the pin 4 of IC101 to ground. ●Adjust R152 for 4.5 volts pin 4 of P102.
2. AFC Coil (L152)	37.4 MHz CARRIER WAVE (Level: 75 to 85 dBμ)	L152	●Remove the short of pin 4 of IC101. ●Short the junction of RN24 and RN26 to ground. ●Connect IF carrier wave to the point ⓓ in Figure 14. ●Adjust L152 for 4.3 volts on the meter at pin 4 of P102. ●After completing CN52 adjustment, repeat this step again.
3. AFC Capacitor (CN52)	32.7 MHz CARRIER WAVE (Level: 75 to 85 dBμ)	CN52	●Remove the short of RN24 and RN26 to ground. ●Connect IF carrier wave to the point ⓓ in Figure 14. ●Adjust CN52 for 4.3 volts on the meter at pin 4 of P102. ●After completing L152 adjustment repeat this step again.

SECAM DET-OUT & SOUND IF ALIGNMENT

L SECAM DET-OUT (R151) ADJUSTMENT

1. Unsolder the solder link SL-1 to disconnect.
2. Supply +12 V to pin 3 of P102.
3. Short pin 8 of P103 to ground to keep the voltage at pin 30 of IC101 in 4 volts.
4. Set AGC to Self AGC condition.
5. Connect synchroscope to pin 31 of IC101 through 10:1 probe.
6. Connect the 2-signal generator to IF input, and set up the generator as described below.
   IF frequency : 32.7 MHz
   Signal level : 75 to 85 dBμ
   Video modulation
   Positive modulation : 100%
   Video signal fH : 15.625 kHz
   Picture : Pattern with 100% white
7. Adjust the AC LEVEL Control (R151) for 4Vp-p on the scope.

SECAM SOUND DET (L651) ADJUSTMENT

1. Supply +12V to pin 7 of IC601 through 1K ohm resistor.
2. Connect the Sweep generator to IF input.
   Sweep range : 30 to 40 MHz
   Level : 75 to 85 dBμ
   Marker : 39.2 MHz
3. Connect the oscilloscope to pin 20 of IC601 through 100 kohm resistor.
4. Apply AGC voltage (1 to 3V) to pin 19 of IC601, and fix the AGC voltage for 0.4 volts of output level on the scope.
5. Adjust SECAM SOUND DET Control (L651) so that the marker point (39.2 MHz) on the response can be maximum.

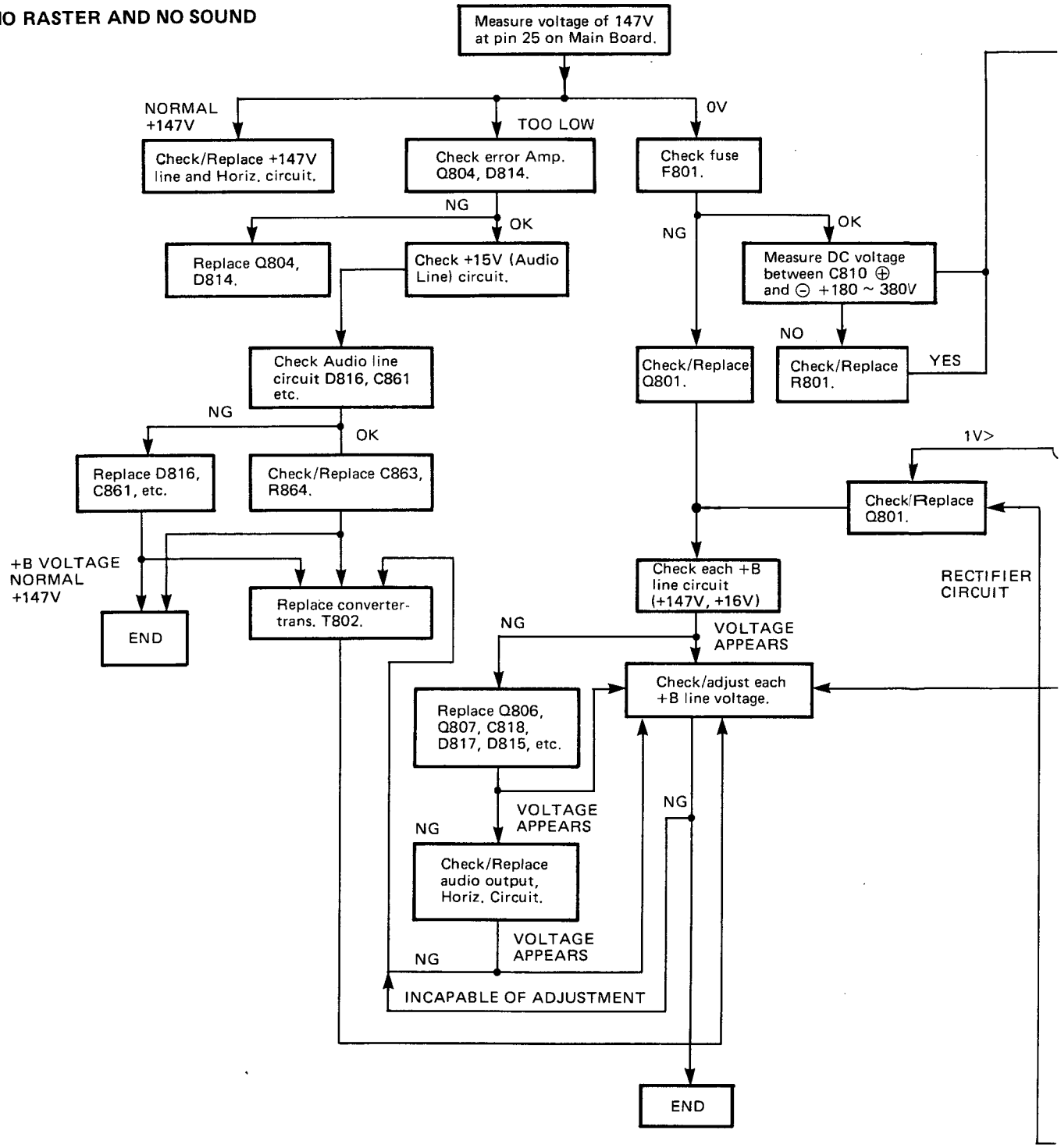
PAL SIF DET (L652) ADJUSTMENT

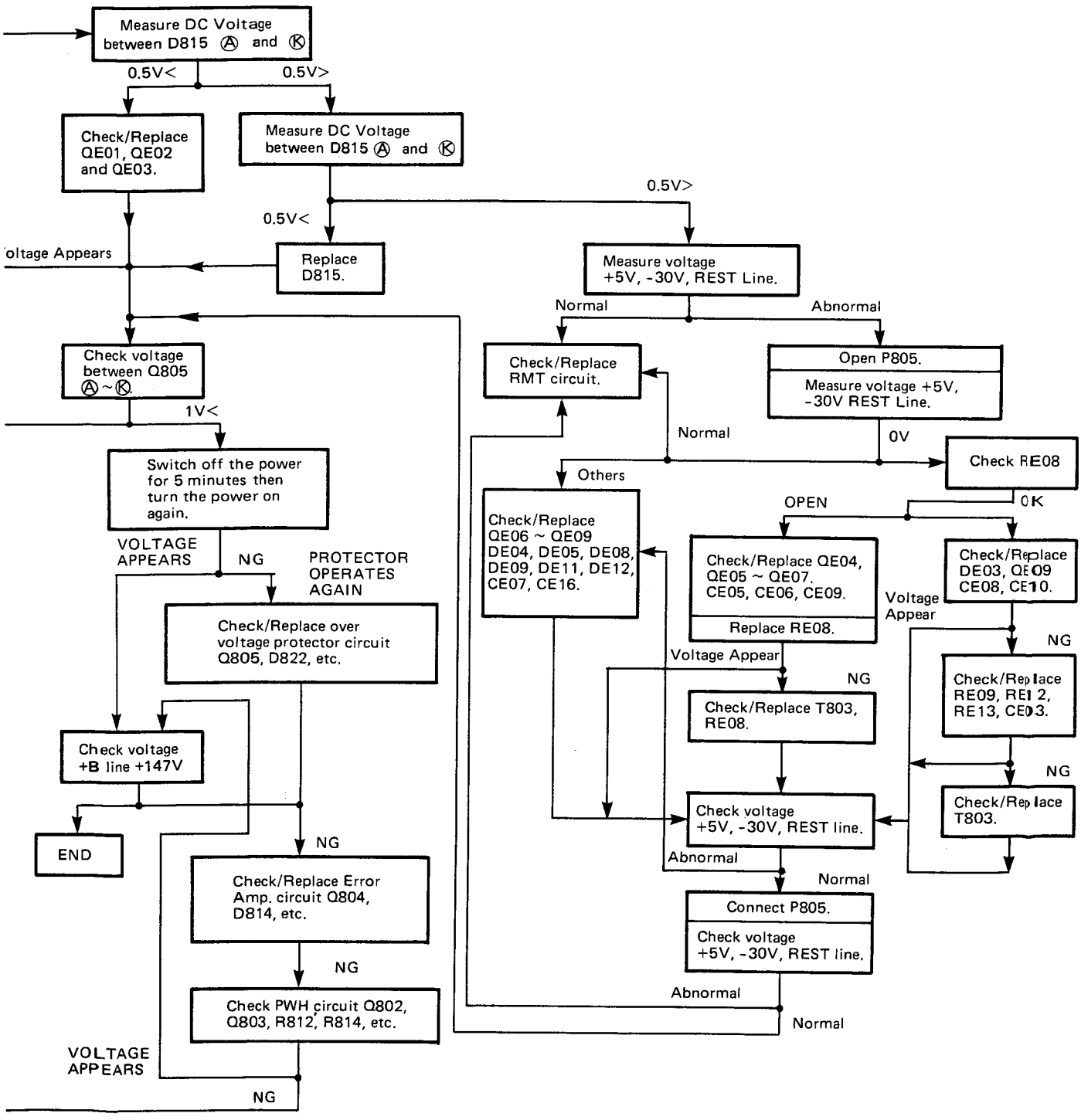
1. Short pin 7 of IC601 to ground
2. Connect SIF generator to pin 13 of IC601 thorugh 0.01 μF capacitor.
3. Connect the oscilloscope to pin 20 of IC601.
4. Set up the SIF generator as described below.
   Sound carrier frequency : 5.5 MHz
   Modulation frequency : 1000 Hz
   Frequency deviation : ±15 kHz
   Signal level : 80 dBμ (50 ohm load)
5. Adjust L652 for the maximum response of 1000 Hz det-out on scope.

TROUBLESHOOTING CHARTS

The following charts are devoted to troublehsooting which, if followed carefully, will assist you in tracking down a fault to the correct stage.
In order to utilize the charts (fault trees), firstly establish the complaint, i.e. – No Raster, No Sound.
Locate the chart applicable and then progress through the various alternatives until a final block indicates the offending components or stage.

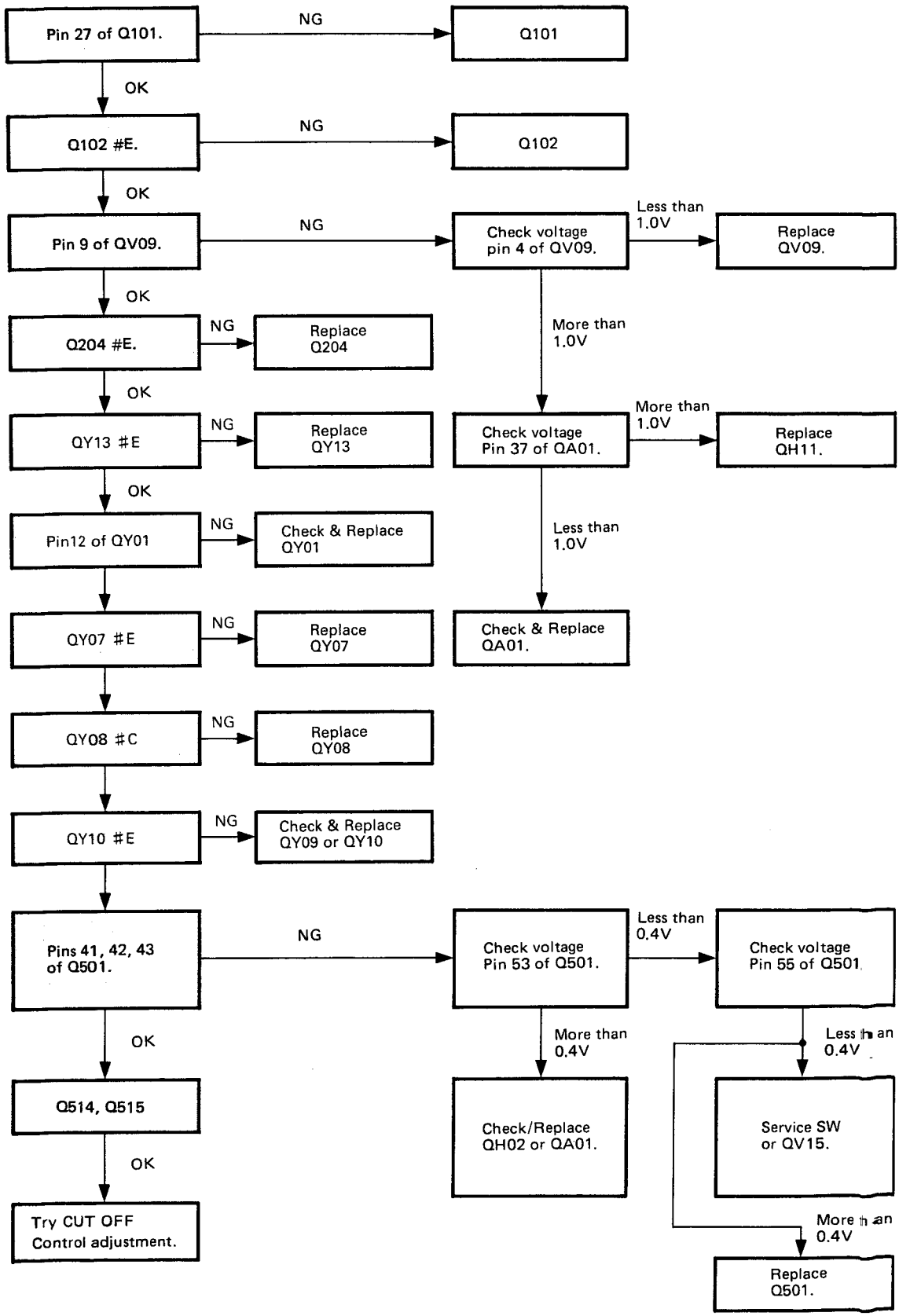
1. NO RASTER AND NO SOUND




Measure DC Voltage between D815 Ⓐ and Ⓚ
0.5V<
0.5V>
Check/Replace QE01, QE02 and QE03.
Measure DC Voltage between D815 Ⓐ and Ⓚ
0.5V>
0.5V<
oltage Appears
Replace D815.
Measure voltage +5V, -30V, REST Line.
Normal
Abnormal
Check voltage between Q805 Ⓐ~Ⓚ
Check/Replace RMT circuit.
Open P805.
Measure voltage +5V, -30V REST Line.
1V<
Normal
0V
Check RE08
Switch off the power for 5 minutes then turn the power on again.
Others
OPEN
OK
VOLTAGE APPEARS
NG
PROTECTOR OPERATES AGAIN
Check/Replace QE06 ~ QE09 DE04, DE05, DE08, DE09, DE11, DE12, CE07, CE16.
Check/Replace QE04, QE05 ~ QE07. CE05, CE06, CE09.
Replace RE08.
Check/Replace DE03, QE09 CE08, CE10.
Voltage Appear
Check/Replace over voltage protector circuit Q805, D822, etc.
Voltage Appear
NG
NG
Check/Replace RE09, RE12, RE13, CE03.
Check voltage +B line +147V
Check/Replace T803, RE08.
NG
END
Check voltage +5V, -30V, REST line.
Check/Replace T803.
NG
Abnormal
Normal
Check/Replace Error Amp. circuit Q804, D814, etc.
Connect P805.
Check voltage +5V, -30V, REST line.
NG
Abnormal
Check PWH circuit Q802, Q803, R812, R814, etc.
Normal
VOLTAGE APPEARS
NG

5. NO PICTURE

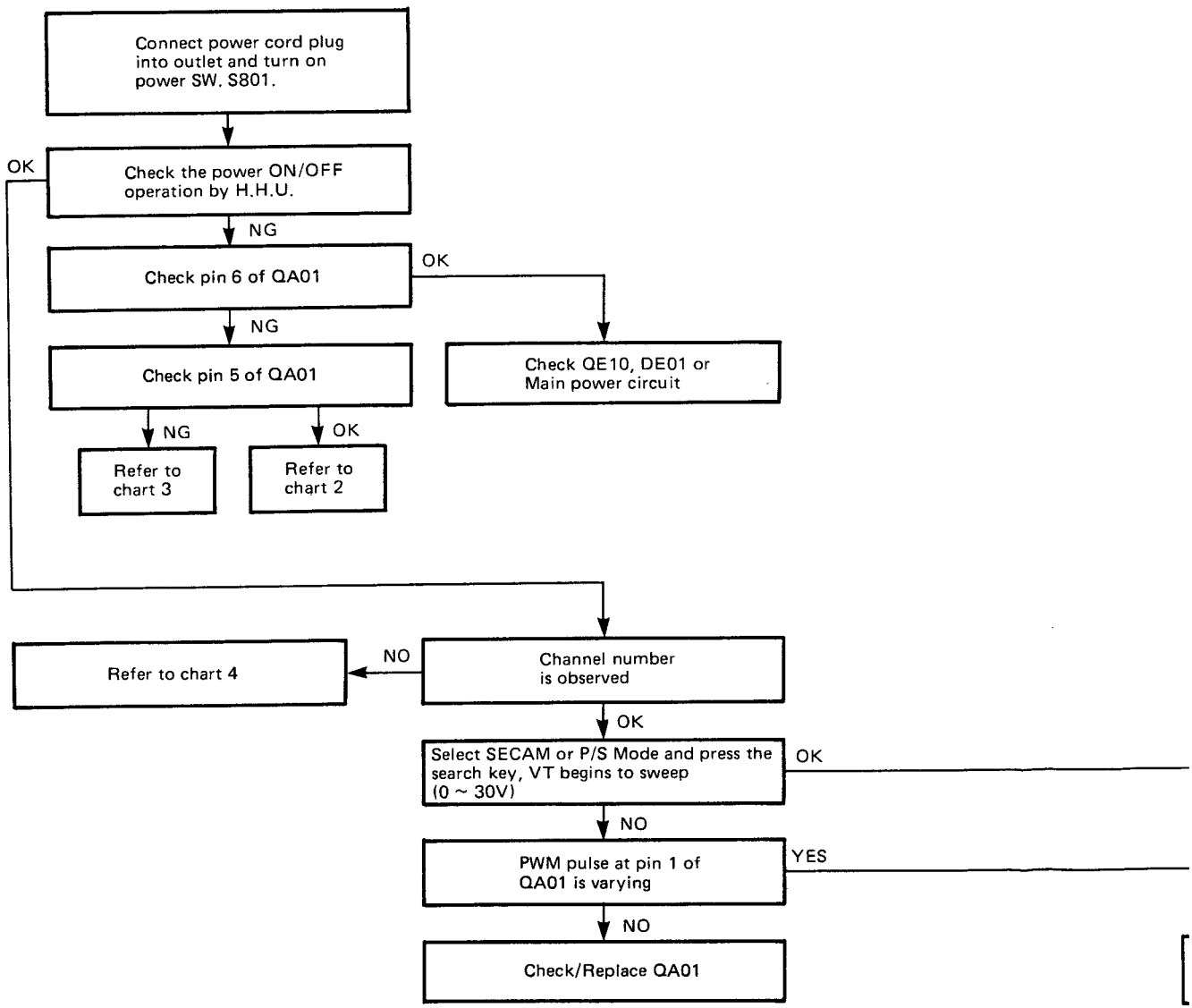
Check video signal waveform for shaded area below.

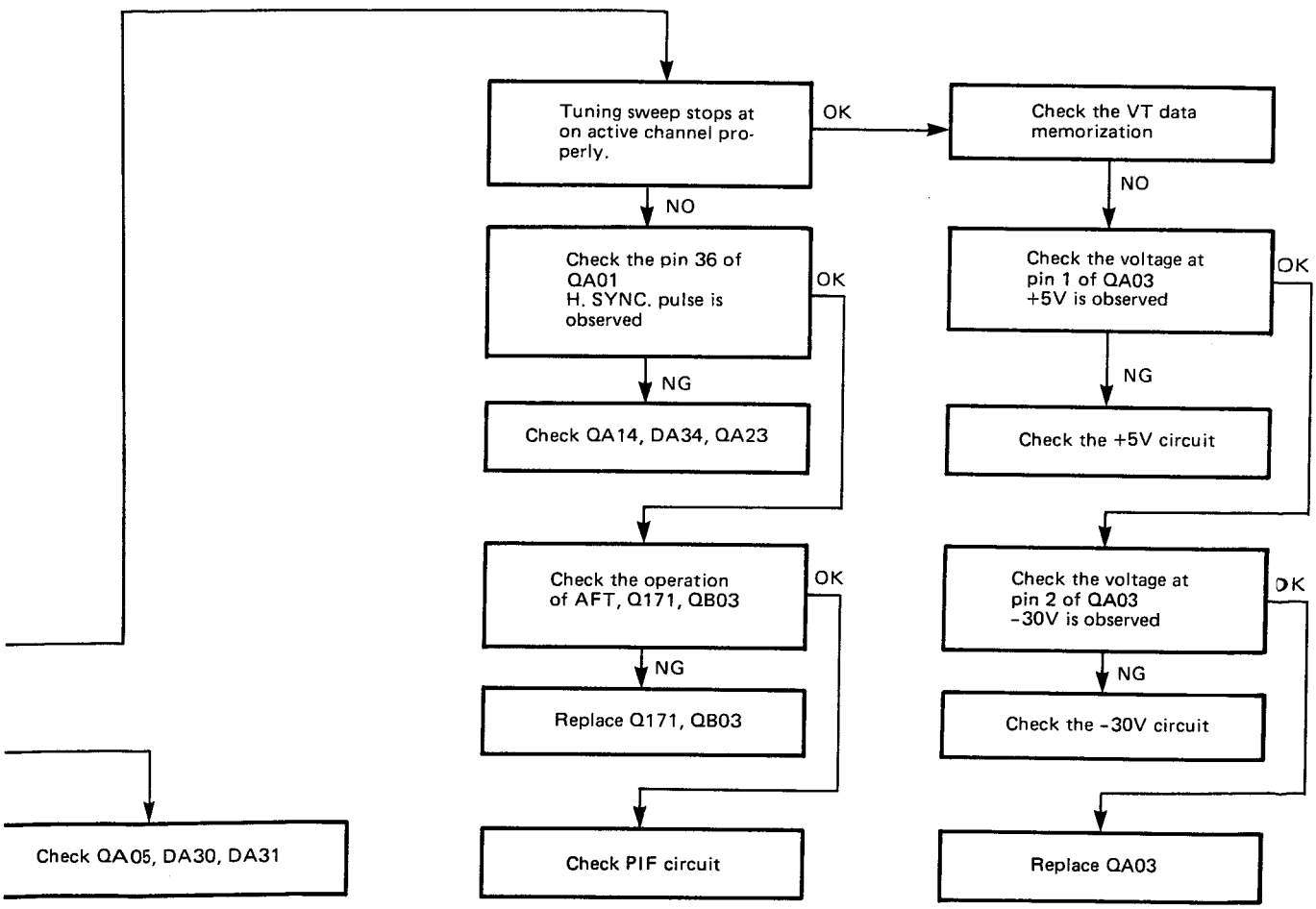


THIS PAGE IS
INTENTIONALLY LEFT
BLANK

6. CHANNEL SELECTOR TROUBLE

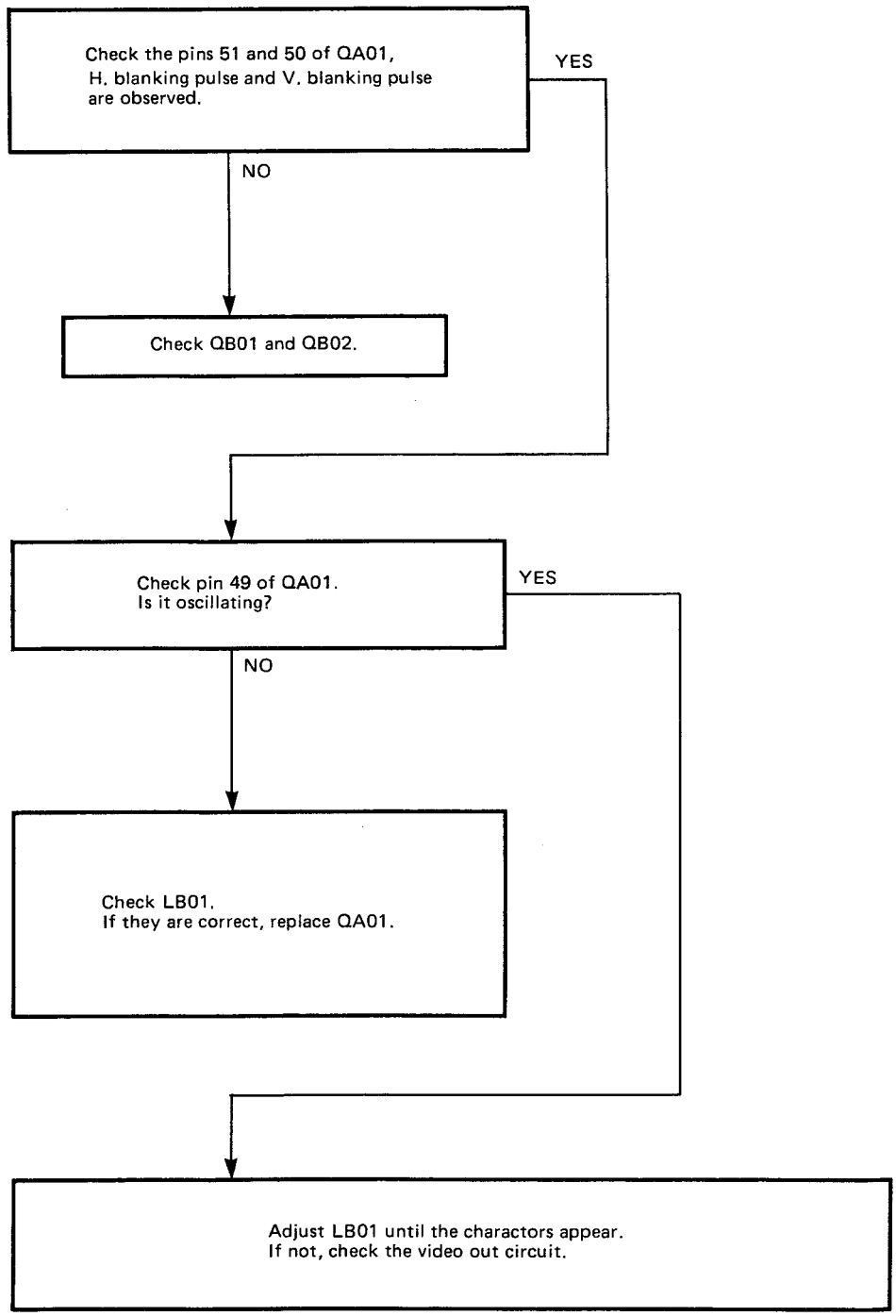
[CHART 1]



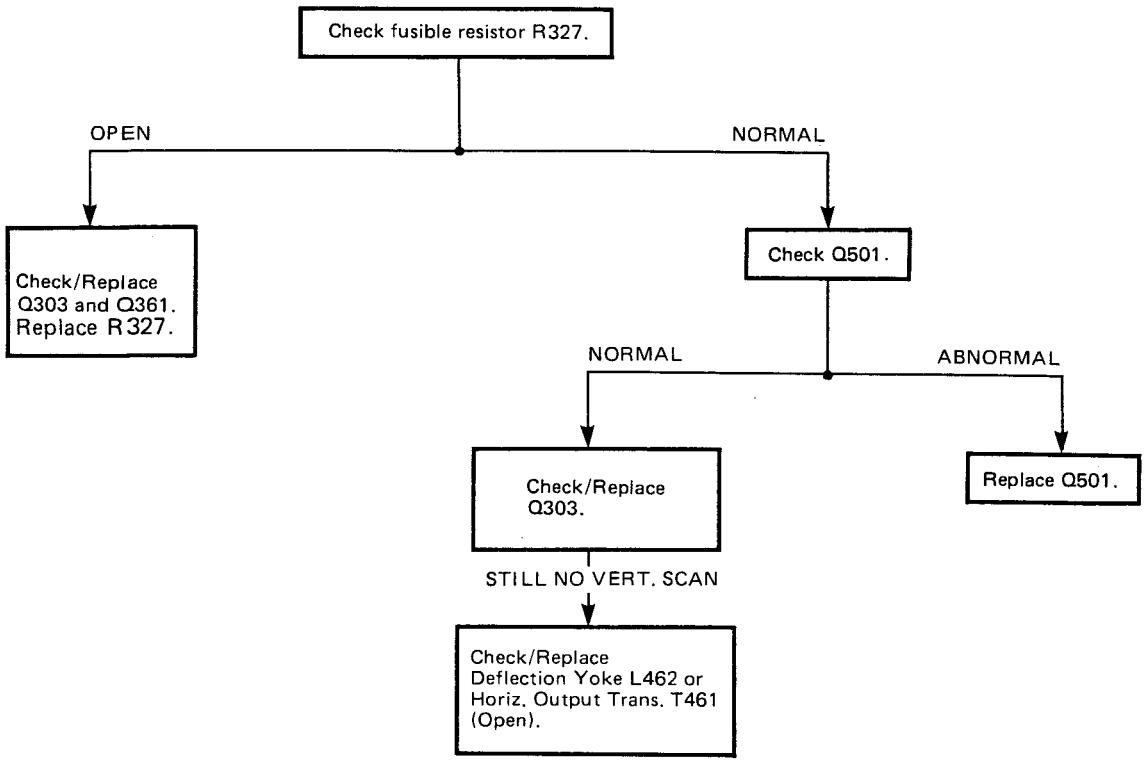

Tuning sweep stops at on active channel properly.
OK
Check the VT data memorization
NO
NO
Check the pin 36 of QA01 H. SYNC. pulse is observed
OK
Check the voltage at pin 1 of QA03 +5V is observed
OK
NG
NG
Check QA14, DA34, QA23
Check the +5V circuit
Check the operation of AFT, Q171, QB03
OK
Check the voltage at pin 2 of QA03 -30V is observed
OK
NG
NG
Replace Q171, QB03
Check the -30V circuit
Check QA05, DA30, DA31
Check PIF circuit
Replace QA03

[CHART 4]

(1) On Screen Display Operation Check

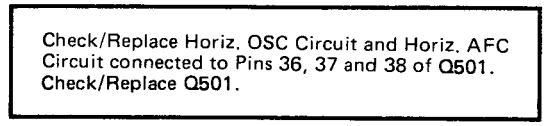


7. NO VERT. SCAN (ONE HORIZ. LINE RASTER)

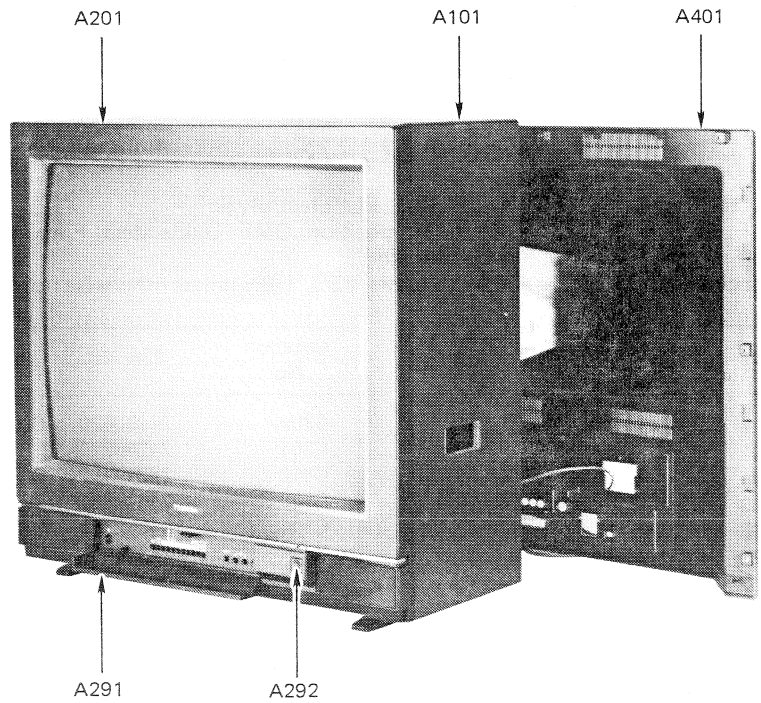


8. OUT OF VERT. SYNC. AND HORIZ. SYNC.

9. OUT OF HORIZ. SYNC.



CABINET REPLACEMENT PARTS LIST



Location No.	Part No.	Description
A101	23887475	Cabinet
A201	23417472	Bezel
A291	23999075	Door
A292	23443030	Knob, POWER
A401	23999078	Back Cover
A507	23030864	Screw, PPS5X.8X27
A604	23874178	Knob, MEMORY
A701	23924050	Carton Box
A702	23934645	Packing
B120	23712306	Screw, PP3X.5X6SZN
Y101	23994402	Owner's Handbook

CHASSIS REPLACEMENT PARTS LIST

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.

CAUTION: The international hazard symbols in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on page 2. Do not degrade the safety of the receiver through improper servicing.

NOTICE: The part number must be used when ordering parts, in order to assist in processing, be sure to include the Model number and Description.

Model 329R7F

ABBREVIATIONS:
Capacitors . . . . CD: Ceramic Disk, PF: Plastic Film, EL: Electrolytic
Resistors . . . . . CF: Carbon Film, CC: Carbon Composition, OMF: Oxide Metal Film, VR: Variable Resistor. MF: Metal Film, FR: Fusible Resistor.
(All CD and PF capacitors are ±5%, 50v and all resistors, ±5%, 1/6w unless otherwise noted.)

Location No.	Part No.	Description
CAPACITORS		
C101	24212102	CD, 1000pF, ±10%
C102	24436471	CD, 470pF
C103	24232103	CD, 0.01μF, +80%, −20%
C104	24617993	EL, 1μF, ±20%, 50V
C105	24617993	EL, 1μF, ±20%, 50V
C106	24232103	CD, 0.01μF, +80%, −20%
C107	24206229	EL, 2.2μF, 50V
C110	24232103	CD, 0.01μF, +80%, −20%
C111	24203100	EL, 10μF, 16V
C112	24538153	PF, 0.015μF
C113	24085988	EL, 1μF, ±20%, 50V, Non-Polar
C114	24206100	EL, 10μF, 50V
C115	24206478	EL, 0.47μF, 50V
C116	24212102	CD, 1000pF, ±10%
C117	24206479	EL, 4.7μF, 50V
C118	24353150	CD, 15pF
C119	24212102	CD, 1000pF, ±10%
C120	24232103	CD, 0.01μF, +80%, −20%
C121	24206100	EL, 10μF, 50V
C122	24232103	CD, 0.01μF, +80%, −20%
C123	24436100	CD, 10pF, ±0.25pF
C124	24212102	CD, 1000pF, ±10%
C126	24436101	CD, 100pF
C161	24212102	CD, 1000pF, ±10%
C162	24232103	CD, 0.01μF, +80%, −20%
C163	24212102	CD, 1000pF, ±10%
C164	24212102	CD, 1000pF, ±10%
C165	24212102	CD, 1000pF, ±10%
C173	24538104	PF, 0.1μF
C201	24206100	EL, 10μF, 50V
C202	24797101	EL, 100μF, 50V
C203	24232103	CD, 0.01μF, +80%, −20%
C204	24206220	EL, 22μF, 50V
C205	24206478	EL, 0.47μF, 50V
C208	24212102	CD, 1000pF, ±10%
C209	24232103	CD, 0.01μF, +80%, −20%
C210	24206100	EL, 10μF, 50V
C240	24206010	EL, 1μF, 50V
C241	24436181	CD, 180pF

Location No.	Part No.	Description
C250	24436820	CD, 82pF
C301	24206229	EL, 2.2μF, 50V
C302	24212152	CD, 1500pF, ±10%
C303	24617891	EL, 1μF, ±10%, 50V
C304	24212102	CD, 1000pF, ±10%
C306	24693563	PF, 0.056μF, 100V
C307	24232103	CD, 0.01μF, +80%, −20%
C311	24796222	EL, 2200μF, 35V
C314	24435510	CD, 51pF, 500V
C316	24795472	EL, 4700μF, 25V
C317	24617981	EL, 2.2μF, ±10%, 50V
C319	24693822	PF, 8200pF, 100V
C320	24214152	CD, 1500pF, ±10%, 500V
C323	24212332	CD, 3300pF, ±10%
C325	24796221	EL, 220μF, 35V
C326	24538563	PF, 0.056μF
C327	24693393	PF, 0.039μF, 100V
C328	24214222	CD, 2200pF, ±10%, 500V
C362	24593223	PF, 0.022μF
C363	24591913	PF, 0.091μF
C364	24212471	CD, 470pF, ±10%
C365	24798470	EL, 47μF, 100V
C366	24593472	PF, 4700pF
C368	24538104	PF, 0.1μF
C370	24829183	PF, 0.018μF, 400V
C371	24095945	PF, 0.47μF, 200V
C372	24095949	PF, 0.33μF, 200V
C373	24593133	PF, 0.013μF
C402	24436241	CD, 240pF
C403	24206339	EL, 3.3μF, 50V
C405	24593203	PF, 0.02μF
C406	24593203	PF, 0.02μF
C407	24593243	PF, 0.024μF
C408	24203101	EL, 100μF, 16V
C409	24232103	CD, 0.01μF, +80%, −20%
C412	24593182	PF, 1800pF
C413	24593182	PF, 1800pF
C416	24214331	CD, 330pF, ±10%, 500V
C417	24214332	CD, 3300pF, ±10%, 500V
C418	24757101	EL, 100μF, 100V
C423	24794101	EL, 100μF, 16V

Location No.	Part No.	Description
C424	24797470	EL, 47μF, 50V
C425	24203101	EL, 100μF, 16V
⚠ C440	24095893	PF, 6200pF, ±3%, 1600V
C441	24214221	CD, 220pF, ±10%, 500V
⚠ C442	24095717	PF, 1.8μF, ±10%, 250V
⚠ C443	24095896	PF, 4700pF, ±3%, 1600V
C444	24829433	PF, 0.043μF, 400V
C445	24828473	PF, 0.047μF, 200V
C446	24640962	EL, 33μF, ±20%, 200V
C447	24640968	EL, 10μF, 400V
C448	24754222	EL, 2200μF, 25V
⚠ C463	24212222	CD, 2200pF, ±10%
⚠ C464	24095541	PF, 2700pF, ±3%, 1600V
C501	24797220	EL, 22μF, 50V
C505	24593273	PF, 0.027μF
C507	24593103	PF, 0.01μF
C508	24085028	EL, 2.2μF, 25V, Non-Polar
C509	24353330	CD, 33pF
C510	24232103	CD, 0.01μF, +80%, −20%
C511	24232103	CD, 0.01μF, +80%, −20%
C512	24353200	CD, 20pF
C515	24206010	EL, 1μF, 50V
C516	24538104	PF, 0.1μF
C517	24538104	PF, 0.1μF
C518	24232103	CD, 0.01μF, +80%, −20%
C519	24232103	CD, 0.01μF, +80%, −20%
C520	24206478	EL, 0.47μF, 50V
C521	24538474	PF, 0.47μF
C522	24538474	PF, 0.47μF
C523	24538474	PF, 0.47μF
C524	24232103	CD, 0.01μF, +80%, −20%
C530	24797220	EL, 22μF, 50V
C531	24203100	EL, 10μF, 16V
C532	24436560	CD, 56pF
C535	24206100	EL, 10μF, 50V
C536	24206478	EL, 0.47μF, 50V
C537	24203101	EL, 100μF, 16V
C539	24232103	CD, 0.01μF, +80%, −20%
C603	24436470	CD, 47pF
C604	24436470	CD, 47pF
C605	24598102	PF, 1000pF
C606	24212472	CD, 4700pF, ±10%
C607	24538223	PF, 0.022μF
C608	24538223	PF, 0.022μF
C609	24206010	EL, 1μF, 50V
C610	24206479	EL, 4.7μF, 50V
C611	24232103	CD, 0.01μF, +80%, −20%
C613	24206479	EL, 4.7μF, 50V
C614	24206229	EL, 2.2μF, 50V
C615	24206479	EL, 4.7μF, 50V
C616	24206479	EL, 4.7μF, 50V
C617	24206479	EL, 4.7μF, 50V
C618	24206229	EL, 2.2μF, 50V
C619	24633470	EL, 47μF, 16V
C620	24206479	EL, 4.7μF, 50V
C621	24593682	PF, 6800pF
C622	24538563	PF, 0.056μF
C623	24593682	PF, 6800pF
C624	24538563	PF, 0.056μF
C625	24795102	EL, 1000μF, 25V
C626	24795101	EL, 100μF, 25V
C627	24795470	EL, 47μF, 25V
C628	24204470	EL, 47μF, 25V
C629	24795101	EL, 100μF, 25V

Location No.	Part No.	Description
C630	24538683	PF, 0.068μF
C631	24538683	PF, 0.068μF
C632	24591473	PF, 0.047μF
C633	24591473	PF, 0.047μF
C634	24796102	EL, 1000μF, 35V
C635	24796102	EL, 1000μF, 35V
C636	24795101	EL, 100μF, 25V
C637	24206229	EL, 2.2μF, 50V
C638	24206229	EL, 2.2μF, 50V
C639	24636339	EL, 3.3μF, 50V
C640	24636100	EL, 10μF, 50V
C641	24636339	EL, 3.3μF, 50V
C642	24206479	EL, 4.7μF, 50V
C644	24204470	EL, 47μF, 25V
C646	24232103	CD, 0.01μF, +80%, −20%
⚠ C801	24095951	PF, 0.1μF, ±20%, AC250V
⚠ C802	24095951	PF, 0.1μF, ±20%, AC250V
⚠ C803	24094654	CD, 470pF, ±20%, AC400V
⚠ C804	24094654	CD, 470pF, ±20%, AC400V
⚠ C805	24086909	EL, 560μF, 400V
C806	24538474	PF, 0.47μF
⚠ C807	24094653	CD, 220pF, ±20%, AC400V
C809	24095931	PF, 2200pF, 1600V
C811	24538474	PF, 0.47μF
C812	24756010	EL, 1μF, 50V
C813	24598242	PF, 2400pF
C814	24212102	CD, 1000pF, ±10%
C815	24756479	EL, 4.7μF, 50V
C816	24643100	EL, 10μF, 200V
C818	24086945	EL, 330μF, ±20%, 200V
C819	24214331	CD, 330pF, ±10%, 500V
C820	24796222	EL, 2200μF, 35V
C821	24630960	EL, 47μF, ±20%, 25V
C822	24442181	CD, 180pF, ±10%, 2kV
C825	24593303	PF, 0.03μF
C826	24756470	EL, 47μF, 50V
⚠ C831	24094906	CD, 4700pF, +80%, −20%, AC250V
⚠ C832	24094906	CD, 4700pF, +80%, −20%, AC250V
⚠ C833	24094906	CD, 4700pF, +80%, −20%, AC250V
⚠ C834	24094906	CD, 4700pF, +80%, −20%, AC250V
C860	24094653	CD, 220pF, ±20%, AC400V
C861	24796222	EL, 2200μF, 35V
C862(U903)	24094655	CD, 1000pF, ±20%, AC400V
C862(UY01)	24442101	CD, 100pF, ±10%, 2kV
C863	24212102	CD, 1000pF, ±10%
C901	24640987	EL, 2.2μF, 350V
C902	24095981	PF, 2200pF, 1600V
CA01	24203470	EL, 47μF, 16V
CA02	24232103	CD, 0.01μF, +80%, −20%
CA03	24203100	EL, 10μF, 16V
CA04	24436300	CD, 30pF
CA05	24436300	CD, 30pF
CA06	24232103	CD, 0.01μF, +80%, −20%
CA07	24203100	EL, 10μF, 16V
CA08	24206100	EL, 10μF, 50V
CA09	24436391	CD, 390pF
CA10	24436221	CD, 220pF
CA11	24538104	PF, 0.1μF
CA12	24538104	PF, 0.1μF
CA14	24206479	EL, 4.7μF, 50V

Location No.	Part No.	Description
CA15	24797220	EL, 22μF, 50V
CA16	24636100	EL, 10μF, 50V
CA17	24538104	PF, 0.1μF
CA18	24206229	EL, 2.2μF, 50V
CA19	24232103	CD, 0.01μF, +80%, −20%
CA22	24432561	CD, 560pF, ±10%
CA23	24212222	CD, 2200pF, ±10%
CA25	24206010	EL, 1μF, 50V
CA28	24212102	CD, 1000pF, ±10%
CA29	24432101	CD, 100pF, ±10%
CA30	24432101	CD, 100pF, ±10%
CA31	24432101	CD, 100pF, ±10%
CA32	24232103	CD, 0.01μF, +80%, −20%
CA33	24432101	CD, 100pF, ±10%
CA34	24232103	CD, 0.01μF, +80%, −20%
CA40	24794102	EL, 1000μF, 16V
CB01	24232103	CD, 0.01μF, +80%, −20%
CB02	24436101	CD, 100pF
CB03	24436101	CD, 100pF
CE03	24591103	PF, 0.01μF
CE05	24206100	EL, 10μF, 50V
CE06	24796471	EL, 470μF, 35V
CE07	24794331	EL, 330μF, 16V
CE08	24203100	EL, 10μF, 16V
CE09	24797470	EL, 47μF, 50V
CE10	24756100	EL, 10μF, 50V
CE15	24442101	CD, 100pF, ±10%, 2kV
CE16	24206229	EL, 2.2μF, 50V
CG31	24206479	EL, 4.7μF, 50V
CG32	24538103	PF, 0.01μF
CG33	24206100	EL, 10μF, 50V
CG34	24538224	PF, 0.22μF
CG35	24206479	EL, 4.7μF, 50V
CH01	24206010	EL, 1μF, 50V
CH02	24206010	EL, 1μF, 50V
CH03	24206010	EL, 1μF, 50V
CH05	24206100	EL, 10μF, 50V
CH06	24232103	CD, 0.01μF, +80%, −20%
CH10	24206010	EL, 1μF, 50V
CH11	24206010	EL, 1μF, 50V
CH12	24206010	EL, 1μF, 50V
CH13	24232103	CD, 0.01μF, +80%, −20%
CH14	24203101	EL, 100μF, 16V
CH15	24232103	CD, 0.01μF, +80%, −20%
CH16	24206229	EL, 2.2μF, 50V
CH17	24206220	EL, 22μF, 50V
CH18	24206229	EL, 2.2μF, 50V
CM01	24436201	CD, 200pF
CM02	24436201	CD, 200pF
CM03	24340080	CD, 8pF, ±0.25pF
CM04	24340080	CD, 8pF, ±0.25pF
CM05	24232103	CD, 0.01μF, +80%, −20%
CM06	24357270	CD, 27pF
CM07	24593273	PF, 0.027μF
CM08	24232103	CD, 0.01μF, +80%, −20%
CN05	24203470	EL, 47μF, 16V
CN10	24436101	CD, 100pF
CN11	24353240	CD, 24pF
CN12(U101)	24232103	CD, 0.01μF, +80%, −20%
CN12(U902)	24436240	CD, 24pF
CN13(U101)	24353220	CD, 22pF
CN13(U902)	24232103	CD, 0.01μF, +80%, −20%
CN14(U101)	24797101	EL, 100μF, 50V
CN14(U902)	24436150	CD, 15pF

Location No.	Part No.	Description
CN15	24232103	CD, 0.01μF, +80%, −20%
CN16	24353220	CD, 22pF
CN17	24353220	CD, 22pF
CN18	24206010	EL, 1μF, 50V
CN51	24094959	Variable Capacitor, 2 to 12pF, 50V
CN52	24094959	Variable Capacitor, 2 to 12pF, 50V
CR01	24203101	EL, 100μF, 16V
CV05	24206010	EL, 1μF, 50V
CV06	24206010	EL, 1μF, 50V
CV07	24206220	EL, 22μF, 50V
CV08	24206229	EL, 2.2μF, 50V
CV09	24794471	EL, 470μF, 16V
CV10	24206229	EL, 2.2μF, 50V
CV14	24232103	CD, 0.01μF, +80%, −20%
CV15	24203100	EL, 10μF, 16V
CV16	24232103	CD, 0.01μF, +80%, −20%
CV17	24794102	EL, 1000μF, 16V
CV18	24538224	PF, 0.22μF
CV19	24206010	EL, 1μF, 50V
CV20	24206010	EL, 1μF, 50V
CV21	24232103	CD, 0.01μF, +80%, −20%
CV22	24206010	EL, 1μF, 50V
CV23	24232103	CD, 0.01μF, +80%, −20%
CV24	24206100	EL, 10μF, 50V
CX02	24538104	PF, 0.1μF
CX03	24538104	PF, 0.1μF
CX04	24538104	PF, 0.1μF
CY01	24206479	EL, 4.7μF, 50V
CY02	24436101	CD, 100pF
CY03	24436271	CD, 270pF
CY04	24436271	CD, 270pF
CY05	24206479	EL, 4.7μF, 50V
CY06	24436101	CD, 100pF
CY07	24436101	CD, 100pF
CY08	24436101	CD, 100pF
CY09	24436331	CD, 330pF
CY10	24436221	CD, 220pF
CY11	24436221	CD, 220pF
CY12	24232103	CD, 0.01μF, +80%, −20%
CY13	24636100	EL, 10μF, 50V
CY14	24538334	PF, 0.33μF
CY15	24797220	EL, 22μF, 50V
CY16	24636100	EL, 10μF, 50V
CY17	24206479	EL, 4.7μF, 50V
CY18	24436102	CD, 1000pF
CY19	24203100	EL, 10μF, 16V
RESISTORS		
R101	24366222	CF, 2200 ohm
R103	24366392	CF, 3900 ohm
R104	24366221	CF, 220 ohm
R105	24366104	CF, 100k ohm
R106	24360185	CF, 1.8M ohm, 1/8W
R107	24366222	CF, 2200 ohm
R108	24366332	CF, 3300 ohm
R109	24366684	CF, 680k ohm
R110	24366562	CF, 5600 ohm
R111	24366271	CF, 270 ohm
R112	24366331	CF, 330 ohm
R113	24366184	CF, 180k ohm
R114	24366101	CF, 100 ohm
⚠ R115	24552151	OMF, 150 ohm, 1/2W

Location No.	Part No.	Description
R116	24366101	CF, 100 ohm
R117	24366101	CF, 100 ohm
R118	24366332	CF, 3300 ohm
R119	24366102	CF, 1k ohm
R120	24366562	CF, 5600 ohm
R121	24366332	CF, 3300 ohm
R122	24366152	CF, 1500 ohm
R123	24366391	CF, 390 ohm
R124	24366223	CF, 22k ohm
R125	24366334	CF, 330k ohm
R126	24366122	CF, 1200 ohm
R127	24366332	CF, 3300 ohm
R128	24366222	CF, 2200 ohm
R130	24366153	CF, 15k ohm
R151	24066952	VR, 10k ohm, 1/10W
R152	24066946	VR, 1M ohm, 1/10W
R153	24066953	VR, 5k ohm, 1/10W
R161	24366331	CF, 330 ohm
R162	24366102	CF, 1k ohm
R163	24366682	CF, 6800 ohm
⚠ R164	24552101	OMF, 100 ohm, 1/2W
R166	24366390	CF, 39 ohm
R167	24366680	CF, 68 ohm
R168	24366272	CF, 2700 ohm
R173	24366102	CF, 1k ohm
R201	24366821	CF, 820 ohm
R203	24366471	CF, 470 ohm
R208	24366101	CF, 100 ohm
R209	24366103	CF, 10k ohm
R210	24366203	CF, 20k ohm
R211	24366622	CF, 6200 ohm
R212	24366103	CF, 10k ohm
R213	24366101	CF, 100 ohm
R214	24366182	CF, 1800 ohm
R215	24366152	CF, 1500 ohm
R216	24366133	CF, 13k ohm
R217	24366101	CF, 100 ohm
R218	24366222	CF, 2200 ohm
R219	24366103	CF, 10k ohm
R222	24366821	CF, 820 ohm
R225	24366103	CF, 10k ohm
R240	24366683	CF, 68k ohm
R241	24366563	CF, 56k ohm
R252	24061591	VR, 2k ohm, 1/8W
R253	24061591	VR, 2k ohm, 1/8W
R255	24061589	VR, 10k ohm, 1/8W
R301	24366301	CF, 300 ohm
R302	24366244	CF, 240k ohm
R303	24366683	CF, 68k ohm
R304	24366102	CF, 1k ohm
R305	24366161	CF, 160 ohm
R306	24366203	CF, 20k ohm
R307	24366101	CF, 100 ohm
⚠ R311	24552242	OMF, 2400 ohm, 1/2W
R312	24366153	CF, 15k ohm
R313	24366392	CF, 3900 ohm
R318	24366102	CF, 1k ohm
R319	24366621	CF, 620 ohm
R320	24366102	CF, 1k ohm
⚠ R321	24552102	OMF, 1k ohm, 1/2W
⚠ R322	24552102	OMF, 1k ohm, 1/2W
⚠ R323	24323828	OMF, 0.82 ohm, 2W
R325	24366163	CF, 16k ohm
⚠ R327	24547629	FR, 6.2 ohm, 1W

Location No.	Part No.	Description
⚠ R328	24552111	OMF, 110 ohm, 1/2W
R330	24553392	OMF, 3900 ohm, 1W
R331	24553122	OMF, 1200 ohm, 1W
R332	24553122	OMF, 1200 ohm, 1W
R351	24066937	VR, 50k ohm, 1/10W
R356	24061589	VR, 10k ohm, 1/8W
R358	24061591	VR, 2k ohm, 1/8W
R359	24061586	VR, 100k ohm, 1/8W
R361	24366623	CF, 62k ohm
R362	24366153	CF, 15k ohm
R363	24366103	CF, 10k ohm
R364	24366473	CF, 47k ohm
R367	24366153	CF, 15k ohm
R368	24366162	CF, 1600 ohm
⚠ R369	24381752	OMF, 7500 ohm, 1/2W
R370	24366752	CF, 7500 ohm
R371	24366103	CF, 10k ohm
R372	24366333	CF, 33k ohm
R373	24366103	CF, 10k ohm
R374	24366472	CF, 4700 ohm
R375	24366273	CF, 27k ohm
R377	24366473	CF, 47k ohm
R378	24366133	CF, 13k ohm
R380	24366823	CF, 82k ohm
R381	24366681	CF, 680 ohm
R382	24366103	CF, 10k ohm
R383	24941515	CC, 5.1M ohm, 1/4W
R384	24366224	CF, 220k ohm
R385	24366224	CF, 220k ohm
⚠ R390	24323159	OMF, 1.5 ohm, 2W
R392	24366512	CF, 5100 ohm
R399	24366432	CF, 4300 ohm
R402	24366273	CF, 27k ohm
R403	24366302	CF, 3k ohm
R405	24366511	CF, 510 ohm
R407	24366221	CF, 220 ohm
R408	24366392	CF, 3900 ohm
⚠ R410	24552432	OMF, 4300 ohm, 1/2W
R411	24366301	CF, 300 ohm
R412	24366241	CF, 240 ohm
⚠ R413	24384822	OMF, 8200 ohm, 3W
⚠ R415	24383123	OMF, 12k ohm, 2W
⚠ R416	24383123	OMF, 12k ohm, 2W
⚠ R417	24383123	OMF, 12k ohm, 2W
⚠ R418	24553242	OMF, 2400 ohm, 1W
R419	24942390	CC, 39 ohm, 1/2W
⚠ R421	24553102	OMF, 1k ohm, 1W
⚠ R423	24552221	OMF, 220 ohm, 1/2W
⚠ R425	24553151	OMF, 150 ohm, 1W
R440	24366103	CF, 10k ohm
R441	24366103	CF, 10k ohm
⚠ R443	24322109	OMF, 1 ohm, 1W
⚠ R444	24323828	OMF, 0.82 ohm, 2W
⚠ R448	24558229	FR, 2.2 ohm, ±10%, 2W
R451	24066938	VR, 20k ohm, 1/10W
R452	24069547	VR, 5k ohm, 0.08W
R502	24366334	CF, 330k ohm
R503	24366202	CF, 2k ohm
R504	24366391	CF, 390 ohm
R505	24366822	CF, 8200 ohm
R507	24366822	CF, 8200 ohm
R509	24366203	CF, 20k ohm
R510	24366101	CF, 100 ohm
R511	24366562	CF, 5600 ohm

Location No.	Part No.	Description
R512	24366152	CF, 1500 ohm
R513	24366152	CF, 1500 ohm
R514	24366562	CF, 5600 ohm
R515	24366221	CF, 220 ohm
R516	24366221	CF, 220 ohm
R517	24366221	CF, 220 ohm
R520	24366103	CF, 10k ohm
R521	24366102	CF, 1k ohm
R522	24945185	CC, 1.8M ohm, ±10%, 1/4W
R531	24366102	CF, 1k ohm
R532	24366182	CF, 1800 ohm
R533	24366102	CF, 1k ohm
R534	24376104	CF, 100k ohm, 1/2W
R535	24366222	CF, 2200 ohm
R536	24376104	CF, 100k ohm, 1/2W
R537	24366132	CF, 1300 ohm
R538	24366242	CF, 2400 ohm
R539	24366132	CF, 1300 ohm
R540	24376104	CF, 100k ohm, 1/2W
R541	24366821	CF, 820 ohm
R542	24366271	CF, 270 ohm
R543	24366103	CF, 10k ohm
R544	24366101	CF, 100 ohm
R547	24366471	CF, 470 ohm
R548	24366471	CF, 470 ohm
R549	24366471	CF, 470 ohm
R551	24066955	VR, 1k ohm, 1/10W
R557	24061591	VR, 2k ohm, 1/8W
R558	24061591	VR, 2k ohm, 1/8W
R559	24061591	VR, 2k ohm, 1/8W
R560	24366822	CF, 8200 ohm
R561	24366822	CF, 8200 ohm
R562	24366822	CF, 8200 ohm
R563	24366104	CF, 100k ohm
⚠ R591	24383153	OMF, 15k ohm, 2W
⚠ R592	24383153	OMF, 15k ohm, 2W
⚠ R593	24383153	OMF, 15k ohm, 2W
R601	24366151	CF, 150 ohm
R602	24366102	CF, 1k ohm
R603	24366102	CF, 1k ohm
R606	24366272	CF, 2700 ohm
R607	24366473	CF, 47k ohm
R608	24366103	CF, 10k ohm
R609	24366271	CF, 270 ohm
R613	24366102	CF, 1k ohm
R614	24366332	CF, 3300 ohm
R615	24366124	CF, 120k ohm
R616	24366124	CF, 120k ohm
R617	24366473	CF, 47k ohm
R618	24366472	CF, 4700 ohm
R620	24366122	CF, 1200 ohm
R621	24366122	CF, 1200 ohm
R622	24366122	CF, 1200 ohm
R623	24366103	CF, 10k ohm
R624	24366154	CF, 150k ohm
R625	24366154	CF, 150k ohm
R626	24366182	CF, 1800 ohm
R627	24366562	CF, 5600 ohm
R628	24366103	CF, 10k ohm
R629	24366562	CF, 5600 ohm
R630	24366472	CF, 4700 ohm
R631	24366103	CF, 10k ohm
R632	24366472	CF, 4700 ohm
R633	24366182	CF, 1800 ohm

Location No.	Part No.	Description
R634	24360331	CF, 330 ohm, 1/8W
R635	24366331	CF, 330 ohm
R636	24366103	CF, 10k ohm
R637	24366473	CF, 47k ohm
R638	24366103	CF, 10k ohm
R639	24366103	CF, 10k ohm
R640	24366473	CF, 47k ohm
R641	24366822	CF, 8200 ohm
⚠ R642	24322398	OMF, 0.39 ohm, 1W
⚠ R643	24321229	OMF, 2.2 ohm, 1/2W
⚠ R644	24321229	OMF, 2.2 ohm, 1/2W
R645	24366822	CF, 8200 ohm
R665	24946331	CC, 330 ohm, ±10%, 1/2W
R666	24946331	CC, 330 ohm, ±10%, 1/2W
R667	24366103	CF, 10k ohm
R668	24366103	CF, 10k ohm
R694	24366124	CF, 120k ohm
⚠ R802	24007938	Cement, 180 ohm, 15W
⚠ R803	24965563	OMF, 56k ohm, 3W
⚠ R804	24552362	OMF, 3600 ohm, 1/2W
⚠ R805	24007771	Cement, 10 ohm, 10W
R806	24366361	CF, 360 ohm
R807	24366100	CF, 10 ohm
⚠ R808	24321478	OMF, 0.47 ohm, 1/2W
R809	24366361	CF, 360 ohm
⚠ R810	24327164	MF, 160k ohm, ±1%, 1/4W
⚠ R811	24327184	MF, 180k ohm, ±1%, 1/4W
⚠ R812	24553202	OMF, 2k ohm, 1W
R813	24366393	CF, 39k ohm
⚠ R814	24327561	MF, 560 ohm, ±1%, 1/4W
R815	24366622	CF, 6200 ohm
R816	24366112	CF, 1100 ohm
⚠ R817	24003987	MF, 1k ohm, ±2%, 1/4W
⚠ R818	24327202	MF, 2k ohm, ±1%, 1/4W
⚠ R819	24552470	OMF, 47 ohm, 1/2W
⚠ R820	24531220	FR, 22 ohm, 1/2W
R823	24366100	CF, 10 ohm
R824	24366472	CF, 4700 ohm
R825	24366102	CF, 1k ohm
⚠ R827	24531222	FR, 2200 ohm, 1/2W
R828	24377154	CF, 150k ohm, 1W
⚠ R831	24007861	Cement, 3.9 ohm, 15W
⚠ R832	24007885	Cement, 2.2 ohm, 10W
⚠ R833	24321228	OMF, 0.22 ohm, 1/2W
R851	24066917	VR, 500 ohm, 1/10W
R860	24942565	CC, 5.6M ohm, 1/2W
⚠ R861	24383361	OMF, 360 ohm, 2W
⚠ R862	24383361	OMF, 360 ohm, 2W
⚠ R865	24383621	OMF, 620 ohm, 2W
⚠ R890	24000875	PTC Thermistor, 18 ohm, ±20%, 290V
R901	24946272	CC, 2700 ohm, ±10%, 1/2W
R902	24946272	CC, 2700 ohm, ±10%, 1/2W
R903	24946272	CC, 2700 ohm, ±10%, 1/2W
⚠ R920	24000880	FR, 5.1 ohm, 1W
RA01	24366472	CF, 4700 ohm
RA02	24366562	CF, 5600 ohm
RA03	24366223	CF, 22k ohm
RA04	24366562	CF, 5600 ohm
RA06	24366102	CF, 1k ohm
RA07	24366102	CF, 1k ohm
RA08	24366102	CF, 1k ohm
RA09	24366102	CF, 1k ohm
RA10	24366102	CF, 1k ohm

Location No.	Part No.	Description
RA11	24366102	CF, 1k ohm
RA12	24366102	CF, 1k ohm
RA13	24366102	CF, 1k ohm
RA14	24366103	CF, 10k ohm
RA15	24366103	CF, 10k ohm
RA26	24366104	CF, 100k ohm
RA28	24366473	CF, 47k ohm
RA29	24366434	CF, 430k ohm
RA30	24366223	CF, 22k ohm
RA31	24366272	CF, 2700 ohm
RA32	24366102	CF, 1k ohm
RA34	24366102	CF, 1k ohm
RA36	24366473	CF, 47k ohm
RA37	24366103	CF, 10k ohm
RA38	24366104	CF, 100k ohm
RA39	24366163	CF, 16k ohm
RA42	24366102	CF, 1k ohm
RA43	24366223	CF, 22k ohm
RA46	24366102	CF, 1k ohm
RA47	24366102	CF, 1k ohm
RA48	24366102	CF, 1k ohm
RA49	24366102	CF, 1k ohm
⚠ RA53	24383183	OMF, 18k ohm, 2W
RA54	24366102	CF, 1k ohm
RA55	24366223	CF, 22k ohm
RA56	24366333	CF, 33k ohm
RA57	24366333	CF, 33k ohm
RA58	24366333	CF, 33k ohm
RA59	24366333	CF, 33k ohm
RA67	24366273	CF, 27k ohm
RA69	24366102	CF, 1k ohm
RA70	24366104	CF, 100k ohm
RA71	24366104	CF, 100k ohm
RA72	24366223	CF, 22k ohm
RA73	24366104	CF, 100k ohm
RA76	24366682	CF, 6800 ohm
RA83	24366431	CF, 430 ohm
RA84	24366103	CF, 10k ohm
RA87	24366102	CF, 1k ohm
RA88	24366431	CF, 430 ohm
RA89	24366431	CF, 430 ohm
RA92	24360225	CF, 2.2M ohm, 1/8W
RA94	24366102	CF, 1k ohm
⚠ RA97	24383223	OMF, 22k ohm, 2W
RA98	24366102	CF, 1k ohm
RA99	24366102	CF, 1k ohm
RB01	24366472	CF, 4700 ohm
RB02	24366302	CF, 3k ohm
RB03	24366103	CF, 10k ohm
RB04	24366103	CF, 10k ohm
RB05	24366302	CF, 3k ohm
RB06	24366562	CF, 5600 ohm
RB10	24366102	CF, 1k ohm
RB11	24366102	CF, 1k ohm
RB12	24366102	CF, 1k ohm
RB13	24366102	CF, 1k ohm
RB14	24366102	CF, 1k ohm
RB15	24366102	CF, 1k ohm
RB16	24366133	CF, 13k ohm
RE02	24376913	CF, 91k ohm, 1/2W
RE03	24376913	CF, 91k ohm, 1/2W
RE04	24366223	CF, 22k ohm
RE05	24366103	CF, 10k ohm
RE06	24366222	CF, 2200 ohm

Location No.	Part No.	Description
RE07	24366562	CF, 5600 ohm
⚠ RE08	24531391	OMF, 390 ohm, 1/2W
RE09	24377224	CF, 220k ohm, 1W
⚠ RE12	24552391	OMF, 390 ohm, 1/2W
RE13	24366182	CF, 1800 ohm
RE14	24366222	CF, 2200 ohm
⚠ RE15	24383330	OMF, 33 ohm, 2W
RE16	24366821	CF, 820 ohm
RE17	24366221	CF, 220 ohm
RE18	24366472	CF, 4700 ohm
⚠ RE19	24554511	OMF, 510 ohm, 2W
⚠ RE21	24383472	OMF, 4700 ohm, 2W
RE22	24366681	CF, 680 ohm
RE24	24366103	CF, 10k ohm
RE25	24366201	CF, 200 ohm
RE26	24366561	CF, 560 ohm
⚠ RE27	24552102	OMF, 1k ohm, 1/2W
⚠ RE28	24553270	OMF, 27 ohm, 1W
RE29	24366103	CF, 10k ohm
RG31	24366473	CF, 47k ohm
RG32	24366512	CF, 5100 ohm
RG33	24366302	CF, 3k ohm
RG34	24366104	CF, 100k ohm
RG35	24366393	CF, 39k ohm
RG36	24366103	CF, 10k ohm
RG37	24366472	CF, 4700 ohm
RG38	24366183	CF, 18k ohm
RG43	24366333	CF, 33k ohm
RG44	24366333	CF, 33k ohm
RG45	24941102	CC, 1k ohm, 1/4W
RH01	24366392	CF, 3900 ohm
RH02	24366392	CF, 3900 ohm
RH03	24366392	CF, 3900 ohm
RH04	24366821	CF, 820 ohm
RH05	24366821	CF, 820 ohm
RH06	24366821	CF, 820 ohm
RH07	24366222	CF, 2200 ohm
RH08	24366103	CF, 10k ohm
RH09	24366222	CF, 2200 ohm
RH10	24366102	CF, 1k ohm
RH11	24366102	CF, 1k ohm
RH12	24366332	CF, 3300 ohm
RH13	24366103	CF, 10k ohm
RH14	24366101	CF, 100 ohm
RH15	24366101	CF, 100 ohm
RH16	24366101	CF, 100 ohm
⚠ RH19	24552271	OMF, 270 ohm, 1/2W
RH25	24366750	CF, 75 ohm
RH26	24366750	CF, 75 ohm
RH27	24366750	CF, 75 ohm
RH28	24366820	CF, 82 ohm
RH29	24366273	CF, 27k ohm
RH30	24366223	CF, 22k ohm
RH31	24366272	CF, 2700 ohm
RH32	24366272	CF, 2700 ohm
RH33	24366682	CF, 6800 ohm
RH34	24366122	CF, 1200 ohm
RH35	24366680	CF, 68 ohm
RH36	24366272	CF, 2700 ohm
RH37	24366682	CF, 6800 ohm
RH38	24366122	CF, 1200 ohm
⚠ RH39	24552221	OMF, 220 ohm, 1/2W
RH40	24366102	CF, 1k ohm
RH41	24366473	CF, 47k ohm

Location No.	Part No.	Description
RH42	24366563	CF, 56k ohm
RH43	24366562	CF, 5600 ohm
RH44	24366102	CF, 1k ohm
RH45	24366473	CF, 47k ohm
RH46	24366103	CF, 10k ohm
RH47	24366393	CF, 39k ohm
RH48	24366153	CF, 15k ohm
RM03	24366272	CF, 2700 ohm
RM04	24366432	CF, 4300 ohm
RM05	24366221	CF, 220 ohm
⚠ RN10	24552471	OMF, 470 ohm, 1/2W
RN11	24366473	CF, 47k ohm
RN14	24366152	CF, 1500 ohm
RN15	24366103	CF, 10k ohm
RN16(U101)	24366473	CF, 47k ohm
RN16(U902)	24366333	CF, 33k ohm
RN17	24366152	CF, 1500 ohm
RN18(U101)	24366103	CF, 10k ohm
RN18(U902)	24366102	CF, 1k ohm
RN19	24366103	CF, 10k ohm
RN20(U101)	24366562	CF, 5600 ohm
RN20(U902)	24366392	CF, 3900 ohm
RN21(U101)	24366562	CF, 5600 ohm
RN21(U902)	24366332	CF, 3300 ohm
RN22	24366152	CF, 1500 ohm
RN23	24366472	CF, 4700 ohm
RN24	24366472	CF, 4700 ohm
RN25	24366472	CF, 4700 ohm
RN26	24366472	CF, 4700 ohm
RN33	24366223	CF, 22k ohm
⚠ RR04	24552470	OMF, 47 ohm, 1/2W
RV03	24366430	CF, 43 ohm
RV04	24366102	CF, 1k ohm
RV11	24366122	CF, 1200 ohm
RV12	24366102	CF, 1k ohm
RV15	24366102	CF, 1k ohm
RV16	24366122	CF, 1200 ohm
RV23	24366102	CF, 1k ohm
RV24	24366473	CF, 47k ohm
RV25	24366102	CF, 1k ohm
RV26	24366473	CF, 47k ohm
RV27	24366680	CF, 68 ohm
RV34	24366102	CF, 1k ohm
⚠ RV35	24552391	OMF, 390 ohm, 1/2W
RV37	24366101	CF, 100 ohm
RV38	24366101	CF, 100 ohm
RV39	24366102	CF, 1k ohm
RV40	24366101	CF, 100 ohm
RV44	24366272	CF, 2700 ohm
RV46	24366472	CF, 4700 ohm
RV48	24366103	CF, 10k ohm
RV51	24366101	CF, 100 ohm
RV53	24366101	CF, 100 ohm
⚠ RV54	24552181	OMF, 180 ohm, 1/2W
⚠ RV55	24552181	OMF, 180 ohm, 1/2W
RV56	24366101	CF, 100 ohm
RV57	24366101	CF, 100 ohm
RV59	24366332	CF, 3300 ohm
RV60	24366103	CF, 10k ohm
RV61	24366821	CF, 820 ohm
RV62	24366561	CF, 560 ohm
RV63	24366101	CF, 100 ohm
RV64	24366332	CF, 3300 ohm
RV65	24366682	CF, 6800 ohm

Location No.	Part No.	Description
RV66	24366101	CF, 100 ohm
RV68	24366152	CF, 1500 ohm
RV69	24366102	CF, 1k ohm
RV70	24366152	CF, 1500 ohm
RV71	24366102	CF, 1k ohm
RV80	24366103	CF, 10k ohm
RV81	24366103	CF, 10k ohm
RX02	24366102	CF, 1k ohm
RX05	24366101	CF, 100 ohm
RX08	24366101	CF, 100 ohm
RX10	24366101	CF, 100 ohm
RX13	24366102	CF, 1k ohm
RY01	24366102	CF, 1k ohm
RY02	24366681	CF, 680 ohm
RY03	24360681	CF, 680 ohm, 1/8W
RY04	24366102	CF, 1k ohm
RY05	24366101	CF, 100 ohm
RY06	24366101	CF, 100 ohm
RY07	24367122	CF, 1200 ohm, ±2%
RY08	24366152	CF, 1500 ohm
RY09	24366152	CF, 1500 ohm
RY10	24366472	CF, 4700 ohm
RY11	24366202	CF, 2k ohm
RY12	24366242	CF, 2400 ohm
RY13	24366392	CF, 3900 ohm
RY14	24366912	CF, 9100 ohm
RY15	24366302	CF, 3k ohm
RY16	24366561	CF, 560 ohm
RY17	24366561	CF, 560 ohm
RY18	24366132	CF, 1300 ohm
RY19	24366182	CF, 1800 ohm
RY20	24366273	CF, 27k ohm
RY21	24366101	CF, 100 ohm
RY22	24366153	CF, 15k ohm
RY23	24366333	CF, 33k ohm
RY24	24366223	CF, 22k ohm
RY25	24366123	CF, 12k ohm
RY26	24366123	CF, 12k ohm
RY27	24366272	CF, 2700 ohm
RY29	24366333	CF, 33k ohm
RY30	24366182	CF, 1800 ohm
RY31	24366181	CF, 180 ohm
RY32	24366182	CF, 1800 ohm
RY33	24366101	CF, 100 ohm
RY34	24366182	CF, 1800 ohm
RY35	24360331	CF, 330 ohm, 1/8W
RY36	24360223	CF, 22k ohm, 1/8W
RY37	24380183	CF, 18k ohm, 1/8W
RY38	24360151	CF, 150 ohm, 1/8W

COILS & TRANSFORMERS

L102	23262819	Coil, PIF, TRF1071D
L103	23261051	Coil, RF Choke, AZ9245E
L106	23261051	Coil, RF Choke, AZ9245E
L107	23237987	Coil, Peaking, TRF4100AC
L108	23238928	Coil, Peaking, TRF4339AC
L151	23262813	Coil, IF Coil, TRF1077D
L152	23262813	Coil, IF Coil, TRF1077D
L162	23221047	Coil, RF Choke, TRF9201
L204	23238916	Coil, Peaking, TRF4330AC
L311	23261974	Coil (Ferrite Bead), HC5-035
L361	23221896	Coil, Choke, TLN3061
L362	23221861	Coil, Choke, TLN3079
L363	23221862	Coil, Choke, TLN3080

Location No.	Part No.	Description
L411	23103940	Coil (Ferrite Bead), TEM2001
L461	23233019	Coil, Linearity, TLN2105
⚠ L462	23227369	Deflection Yoke, TY-32GC4N
L503	23238923	Coil, Peaking, TRF4829AC
L551	23250972	Coil, 1H-Delay Matching, TRF5418
L601	23261986	Coil, RF Choke, TRF9220
L602	23262841	Coil, PIF, TRF1057
L603	23238928	Coil, Peaking, TRF4339AC
L605	23238921	Coil, Peaking, TRF4120AC
L651	23262813	Coil, IF Coil, TRF1077D
L652	23232942	Coil, Variable, TRF3077
L801	23221050	Coil, RF Choke, TLN1015
L802	23261975	Coil, Choke, TRF9229
L803	23222694	Coil, Width, TLN2026
L806	23103981	Coil, RF Choke, RH0630025
L807	23261975	Coil, Choke, TRF9229
L808	23222694	Coil, Width, TLN2026
⚠ L901	23200706	Coil, Degaussing, TSB-2254
LA01	23237999	Coil, Peaking, TRF4109AC
LA02	23221026	Coil, Choke, AZ9004Y
LB01	23262778	Coil, IF Coil, TRF1112
LM01	23262797	Coil, IF Coil, TRF1093D
LM02	23272988	Coil, Chrome Demod, TRF5414
LM03	23272988	Coil, Chrome Demod, TRF5414
LM04	23262798	Coil, IF Coil, TRF1092D
LN03	23238918	Coil, Peaking, TRF4220AC
LY03	23237925	Coil, Peaking, TRF4510AC
LY04	23237980	Coil, Peaking, TRF4390AC
⚠ T401	23224978	Transformer, Horiz. Drive, TLN1046
⚠ T461	23236109	Transformer, Flyback, TFB4070AD
T801	23211962	Line Filter, TRF3117
⚠ T802	23213624	Transformer, Converter, TPW3092
⚠ T803	23213623	Transformer, Converter, TPW3093
T804	23211921	Line Filter, TRF3126

SEMICONDUCTORS

IC101	23318286	IC, T51419SP
IC303	23119142	IC, AN5521
IC361	23318052	IC, TDA8145
IC501	B0379470	IC, TA8659N
IC601	23118328	IC, TDA2460
IC604	B0356190	IC, TA7630P
IC605	23118327	IC, AN7178
ICA01	23318192	IC, M50436-587SP
ICA02	23119182	IC, PD6336C
ICA03	23119101	IC, M58655P
ICA04	23119441	IC, LA7910
ICH01	23119139	IC, AN5862K
ICH10	B0470532	IC, TC4053BP
ICV09	B0379280	IC, TA8628N
ICY01	23318055	IC, TDA4565
Q102	A6317440	Transistor, 2SC1815-Y
Q161	A6708871	Transistor, 2SC388ATM
Q171	A6317440	Transistor, 2SC1815-Y
Q201	A6534040	Transistor, 2SA1015-Y
Q204	A6317440	Transistor, 2SC1815-Y

Location No.	Part No.	Description
Q303B	23035308	Screw, BTB3X8SZN
Q362	A6534040	Transistor, 2SA1015-Y
Q363	A6317440	Transistor, 2SC1815-Y
Q402	A678971D	Transistor, 2SC1569 FA-5
⚠ Q404	A6868953	Transistor, 2SD1432
Q405	A6842185	Transistor, 2SD553-Y
Q406	A671656A	Transistor, 2SC495-Y
Q505	A6319400	Transistor, 2SC2068
Q506	A6317440	Transistor, 2SC1815-Y
Q508	A6319400	Transistor, 2SC2068
Q509	A6317440	Transistor, 2SC1815-Y
Q511	A6319400	Transistor, 2SC2068
Q512	A6317440	Transistor, 2SC1815-Y
Q514	A6509120	Transistor, 2SA562TM-O
Q515	A6317440	Transistor, 2SC1815-Y
Q603	A6317440	Transistor, 2SC1815-Y
Q605B	23035308	Screw, BTB3X8SZN
Q606	A6317440	Transistor, 2SC1815-Y
Q607	A6317440	Transistor, 2SC1815-Y
Q608	A6534040	Transistor, 2SA1015-Y
Q609	A6317440	Transistor, 2SC1815-Y
Q610	A6317440	Transistor, 2SC1815-Y
⚠ Q801	A6865553	Transistor, 2SD1279
Q801C	23712312	Screw, PP3X.5X12SZN
Q801J	23035306	Screw, BTB3X6SZN
Q802	A6533730	Transistor, 2SA1012-Y
⚠ Q803	A6319280	Transistor, 2SC1959-O
Q804	A6534040	Transistor, 2SA1015-Y
⚠ Q805	A7800720	Transistor, SF0R1B41
Q806	A6546025	Transistor, 2SA1265N FA-1
Q807	A6325031	Transistor, 2SC2230-GR
QA05	A6317440	Transistor, 2SC1815-Y
QA13	A6317440	Transistor, 2SC1815-Y
QA14	A6317440	Transistor, 2SC1815-Y
QA17	A6317440	Transistor, 2SC1815-Y
QA19	A6317440	Transistor, 2SC1815-Y
QA23	A6317440	Transistor, 2SC1815-Y
QA25	A6534040	Transistor, 2SA1015-Y
QB01	A6317440	Transistor, 2SC1815-Y
QB02	A6317440	Transistor, 2SC1815-Y
QB03	A6002040	Transistor, RN1204
QE01	A6317440	Transistor, 2SC1815-Y
QE02	A6317440	Transistor, 2SC1815-Y
QE03	A6333346	Transistor, 2SC2655-Y
QE04	A6357856	Transistor, 2SC3148 FA-1
QE06	A6534040	Transistor, 2SA1015-Y
QE07	A6532940	Transistor, 2SA950-Y
QE08	A6314440	Transistor, 2SC1627-Y
QE09	A6532940	Transistor, 2SA950-Y
QE10	A6534040	Transistor, 2SA1015-Y
QG07	A6317440	Transistor, 2SC1815-Y
QG08	A6317440	Transistor, 2SC1815-Y
QH02	A6317440	Transistor, 2SC1815-Y
QH03	A6317440	Transistor, 2SC1815-Y
QH04	A6534040	Transistor, 2SA1015-Y
QH11	A6317440	Transistor, 2SC1815-Y
QH12	A6534040	Transistor, 2SA1015-Y
QH13	A6534040	Transistor, 2SA1015-Y
QN02	A6317440	Transistor, 2SC1815-Y
QN03	A6317440	Transistor, 2SC1815-Y
QN04	A6317440	Transistor, 2SC1815-Y
QV04	A6534040	Transistor, 2SA1015-Y
QV05	A6534040	Transistor, 2SA1015-Y
QV06	A6534040	Transistor, 2SA1015-Y

Location No.	Part No.	Description
QV08	A6317440	Transistor, 2SC1815-Y
QV11	A6534040	Transistor, 2SA1015-Y
QV12	A6534040	Transistor, 2SA1015-Y
QV15	A6317440	Transistor, 2SC1815-Y
QV15	or 23114552	Transistor, 2SC1685-Q
QY02	A6317440	Transistor, 2SC1815-Y
QY03	A6317440	Transistor, 2SC1815-Y
QY04	A6317440	Transistor, 2SC1815-Y
QY07	A6317440	Transistor, 2SC1815-Y
QY08	A6317440	Transistor, 2SC1815-Y
QY09	A6317440	Transistor, 2SC1815-Y
QY10	A6317440	Transistor, 2SC1815-Y
QY11	A6317440	Transistor, 2SC1815-Y
QY12	A6317440	Transistor, 2SC1815-Y
QY13	A6534040	Transistor, 2SA1015-Y
QY15	A6534040	Transistor, 2SA1015-Y
D240	A7150258	Diode, 1SS176
D241	A7150041	Diode, 1SS104
D242	A7246602	Diode, 1S1553 (TV)
D243	A7246711	Diode, 1S1555 (TV)
D301	A7150258	Diode, 1SS176
D302	A7568250	Diode, 1S1834
D303	23118977	Diode, ERC01-02FL
D315	A7110160	Diode, Zener, 05Z7.5Y
D361	A7110611	Diode, Zener, 05Z18Y
D362	A7150258	Diode, 1SS176
D364	A7110160	Diode, Zener, 05Z7.5Y
D366	A7109474	Diode, Zener, 05Z4.7Y
D367	A7150258	Diode, 1SS176
D368	A7110725	Diode, Zener, 05Z30Y
D401	A7110262	Diode, Zener, 05Z9.1Y
D402	A7568615	Diode, 1S1886
D404	A7150258	Diode, 1SS176
D405	A7110634	Diode, Zener, 05Z20Y
D406	A7978850	Diode, S5295G
D407	A7116515	Diode, Zener, 04AZ6.2Y
D408	A7580660	Diode, 3JH61
D409	A7116515	Diode, Zener, 04AZ6.2Y
D409	A7110311	Diode, Zener, 05Z10X
D410	A7116815	Diode, Zener, 04AZ8.2Y
D440	23115915	Diode, ERC26-15T
D441	A7580660	Diode, 3JH61
D501	A7110262	Diode, Zener, 05Z9.1Y
D594	A7150258	Diode, 1SS176
D595	A7150258	Diode, 1SS176
D596	A7150258	Diode, 1SS176
D614	A7150258	Diode, 1SS176
D615	A7150258	Diode, 1SS176
D617	A7150258	Diode, 1SS176
D699	A7110664	Diode, Zener, 05Z24Y
D804	A7978855	Diode, S5295J
D805	A7568300	Diode, 1S1835
D806	23115690	Diode, GU3C
D807	A7568300	Diode, 1S1835
D808	A7568300	Diode, 1S1835
D809	A7568300	Diode, 1S1835
D810	A7568300	Diode, 1S1835
D811	A7978850	Diode, S5295G
D812	A7150258	Diode, 1SS176
D813	A7150258	Diode, 1SS176
D814	A7116805	Diode, Zener, 04AZ8.2X
D815	23118451	Diode, RU4A
D816	23118943	Diode, ERC20-04
D820	A7150351	Diode, 1SS178

Location No.	Part No.	Description
D822	A7116505	Diode, Zener, 04AZ6.2X
⚠ D831	A7568410	Diode, TVR-4J
⚠ D832	A7568410	Diode, TVR-4J
⚠ D833	A7568410	Diode, TVR-4J
⚠ D834	A7568410	Diode, TVR-4J
DA01	A7150258	Diode, 1SS176
DA02	A7150258	Diode, 1SS176
DA03	A7150258	Diode, 1SS176
DA04	A7150258	Diode, 1SS176
DA05	A7150258	Diode, 1SS176
DA06	A7150258	Diode, 1SS176
DA07	A7150258	Diode, 1SS176
DA09	A7150258	Diode, 1SS176
DA15	A7150258	Diode, 1SS176
DA16	A7150258	Diode, 1SS176
DA17	A7150258	Diode, 1SS176
DA19	A7150258	Diode, 1SS176
DA30	23115878	Diode, Zener, μPC574JC
DA31	A7150258	Diode, 1SS176
DA33	A7150258	Diode, 1SS176
DA34	A7110041	Diode, Zener, 05Z5.1Y
DA35	A7150258	Diode, 1SS176
DA37	A7150258	Diode, 1SS176
DA39	A7246711	Diode, 1S1555 (TV)
DA55	A8636460	Diode (LED), TLS208, Red
DB01	A7110041	Diode, Zener, 05Z5.1Y
⚠ DE01	23115571	Photo Coupler, PC510
DE02	A7150258	Diode, 1SS176
DE03	A7150258	Diode, 1SS176
DE04	A7116405	Diode, Zener, 04AZ5.6X
DE05	A7978850	Diode, S5295G
DE06	A7978850	Diode, S5295G
DE07	A7978850	Diode, S5295G
DE08	23118610	Diode, Zener, RD30ES-B4
DE09	A7116205	Diode, Zener, 04AZ4.7X
DE11	A7150258	Diode, 1SS176
DE12	A7116405	Diode, Zener, 04AZ5.6X
DE55	A8636460	Diode (LED), TLS208, Red
DG55	A8612360	Diode (LED), TLO208, Orange
DH01	23115535	Diode, OA91
DH02	23115535	Diode, OA91
DH03	23115535	Diode, OA91
DH04	23115535	Diode, OA91
DH05	23115535	Diode, OA91
DH06	23115535	Diode, OA91
DH07	A7150258	Diode, 1SS176
DH08	A7150258	Diode, 1SS176
DH09	A7150258	Diode, 1SS176
DH10	A7109474	Diode, Zener, 05Z4.7Y
DH14	A7288601	Diode, 1S2186 FA-1
DH15	A7288601	Diode, 1S2186 FA-1
DH16	A7150258	Diode, 1SS176
DH17	A7150258	Diode, 1SS176
DH18	A7150258	Diode, 1SS176
DH19	A7150258	Diode, 1SS176
DH20	A7150258	Diode, 1SS176
DN01	A7288601	Diode, 1S2186 FA-1
DN02	A7110040	Diode, Zener, 05Z5.1X
DN03	A7288601	Diode, 1S2186 FA-1
DN06	A7150258	Diode, 1SS176
DN07	A7150258	Diode, 1SS176
DN10	A7110041	Diode, Zener, 05Z5.1Y
DS55	A8606660	Diode (LED), TLG208, Green

Location No.	Part No.	Description
DV05	A7150258	Diode, 1SS176

MISCELLANEOUS

Location No.	Part No.	Description
⚠ F801	23144868	Fuse, 3.15A
F801A	23165102	Fuse Holder
⚠ F802	23144871	Fuse, 1.6A
F802A	23165102	Fuse Holder
K901	23120693	Remote Sensor, HC-TB05
K902	23120702	Remote Hand Unit, CT9191
P003	23161745	Terminal, 4P
P661	23363607	Headphone Jack
⚠ P801	23176704	Power Cord
P803	23164725	Plug, 2P
PV01	23901910	Socket, 21P
PV02	23363872	Pin Jack, Yellow
PV03	23363871	Pin Jack, Red
PV04	23363873	Pin Jack, White
PV08	23164561	Plug, 5P
S001	23145467	Switch, Slide, 2C2P
S201	23145579	Switch, Push, 2C2P
S202	23145542	Switch, Lever, 1C3P
S301	23145542	Switch, Lever, 1C3P
⚠ S801	23145434	Switch, Power, 2C2P
SA02	23145430	Switch, Push, 1C1P
SA03	23145430	Switch, Push, 1C1P
SA04	23145579	Switch, Push, 2C2P
SA05	23145429	Switch, Push, 1C1Px3
SA06	23145429	Switch, Push, 1C1Px3
SA07	23145429	Switch, Push, 1C1Px3
SA08	23145428	Switch, Push, 1C1Px4
SA09	23145428	Switch, Push, 1C1Px4
SA10	23145428	Switch, Push, 1C1Px4
SA11	23145428	Switch, Push, 1C1Px4
SA14	23145430	Switch, Push, 1C1P
SA15	23145430	Switch, Push, 1C1P
SA16	23145430	Switch, Push, 1C1P
SA17	23145430	Switch, Push, 1C1P
SA18	23145430	Switch, Push, 1C1P
⚠ V901A	23901293	Socket, CRT, 10P
V901M	23102898	Magnet, Purity-Convergence, TP-12300
W201	23250919	Coil, Delay Line, TRF2069
W661	23151210	Speaker, 50x120mm, 4 ohm, SPK-1213
W662	23151210	Speaker, 50x120mm, 4 ohm, SPK-1213
X401	23153886	Ceramic Resonator, 503kHz, TCR1012
X501	23153979	Crystal, 4.43MHz
X502	23153885	1H-Delay Line, ADLCS343TH02
Z101	A5613170	PIF SAW Filter, F1038
Z102	23153795	Ceramic Resonator, 500kHz, TCR1109
Z103	23107972	Ceramic Video Trap, 5.5MHz, TPS5.5MB
Z601	A5613023	SIF SAW Filter, F328BM
Z602	23107947	Ceramic Filter, 5.5MHz, SFE5.5MBF
ZA01	23153845	Ceramic Resonator, 4MHz, TCR1015
ZA02	24000788	Resistor Block, 4700 ohmx4, 1/8W

PC BOARD ASSEMBLIES

Location No.	Part No.	Description
U101	23333556	IF Board, PW6501
U301	23333557	DPC Board, PW6502
U501	23332485	R.G.B. Board, PW5884
U801	23332680	Power-2 Board, PW5969
U902	23333559	Main Board, PW6504
U903A	23333561	Power Board, PW6503-1
U903B	23333562	CRT Drive Board, PW6503-2
U903C	23333563	A/V Terminal Board, PW6503-3
UA02	23333560	IR-Amp Board, PW6505
UY01	23333564	CTI Board, PW6506

PICTURE TUBE

Location No.	Part No.	Description
⚠ V901	A5525439	Picture Tube, A76JTS90X (W), SVC

TUNER

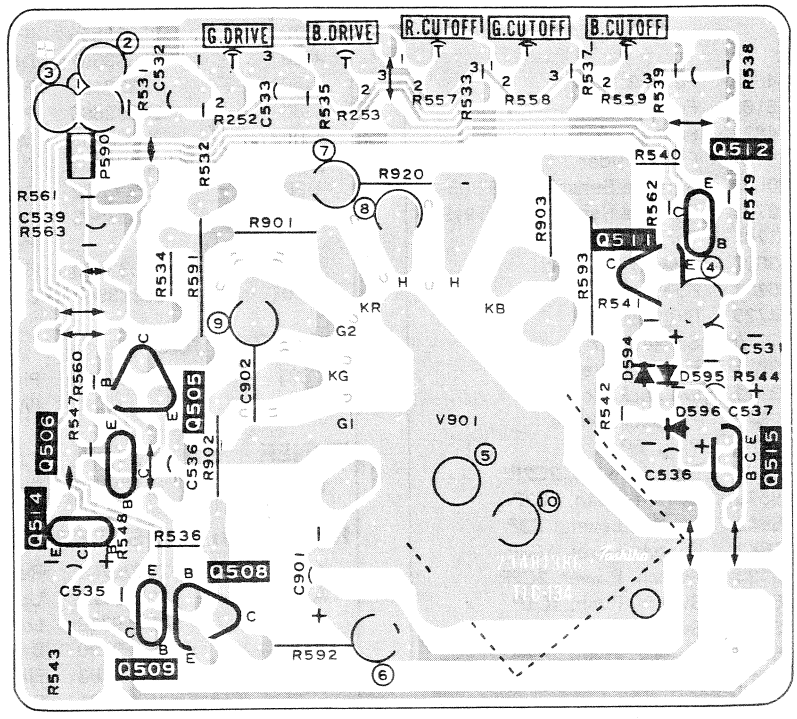
Location No.	Part No.	Description
H001	23121623	Tuner, VHF/UHF, EF441A

REMOTE HAND SET PARTS

Location No.	Part No.	Description
K902	23120702	Remote Hand Unit, CT9191
AT01	23309728	Upper Case
AT02	23309719	Lower Case
AT03	23309720	Battery Cover
AT04	23309583	Filter
PT01	23309581	Battery Terminal, Plus Pole
PT02	23309582	Battery Terminal, Minus Pole
PT03	23309580	Battery Terminal Spring, Short
ST01	23309729	Rubber
UT01	23332015	Remote Hand Unit Board, PW5527
ZT01	23109327	Ceramic Resonator, 2kHz, CSB455E

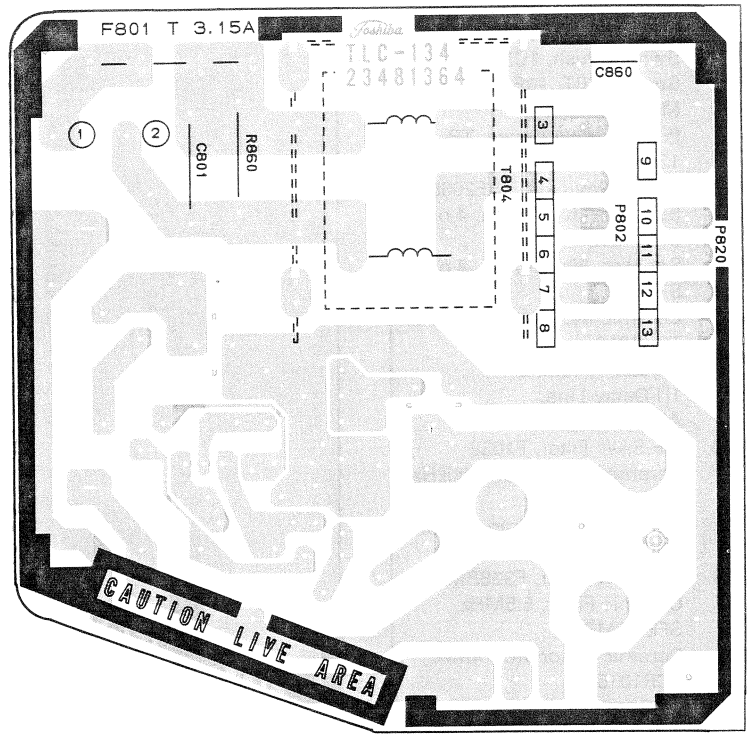
CRT DRIVE BOARD PW6503-2

BOTTOM (FOIL) SIDE

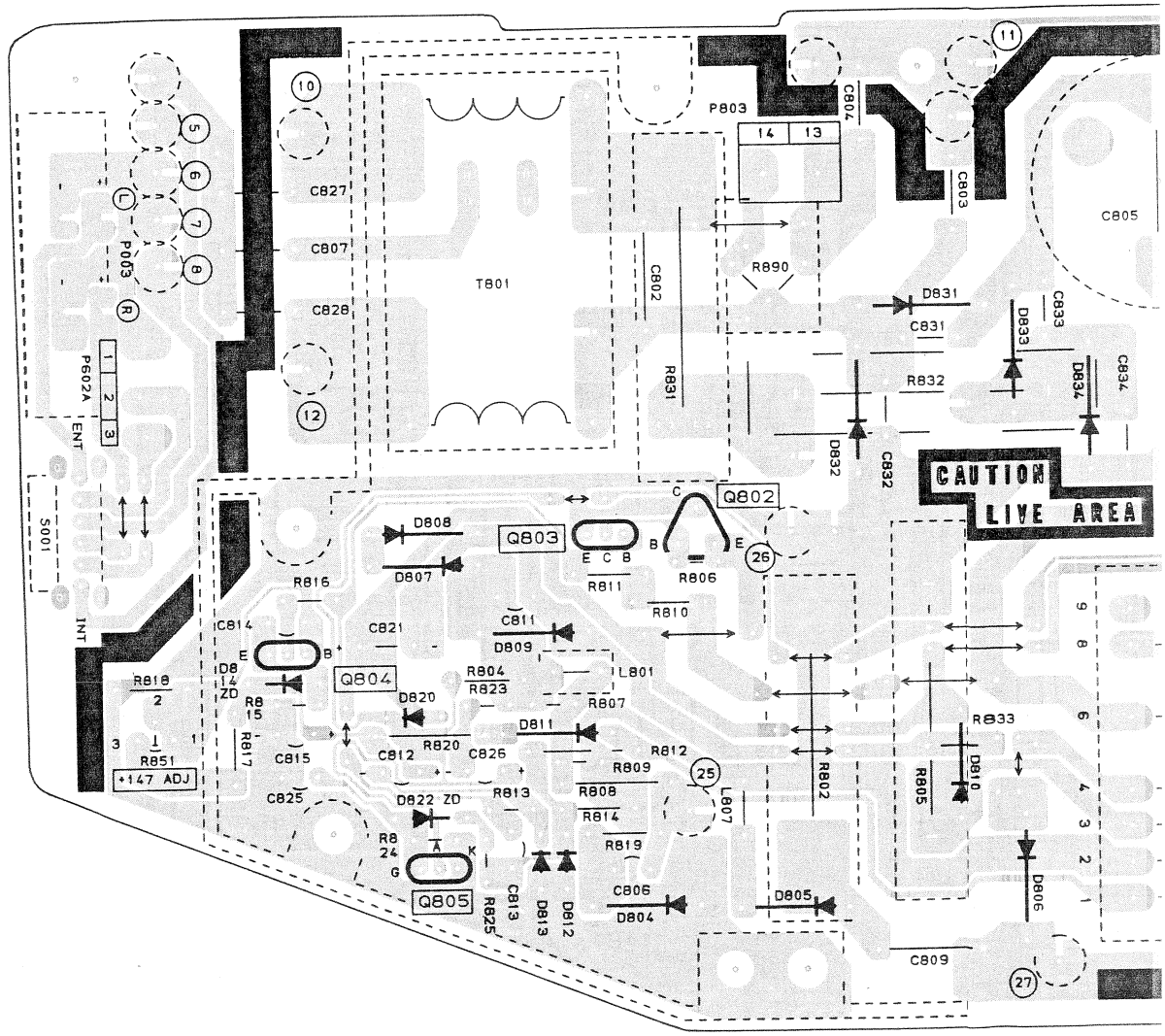


POWER-2 BOARD PW5969

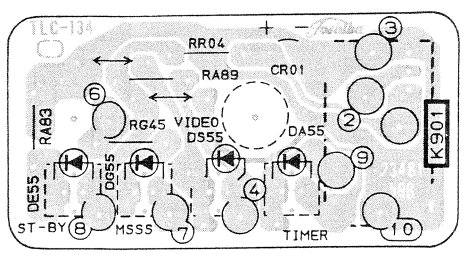
BOTTOM (FOIL) SIDE



POWER BOAI
BOTTOM (F(

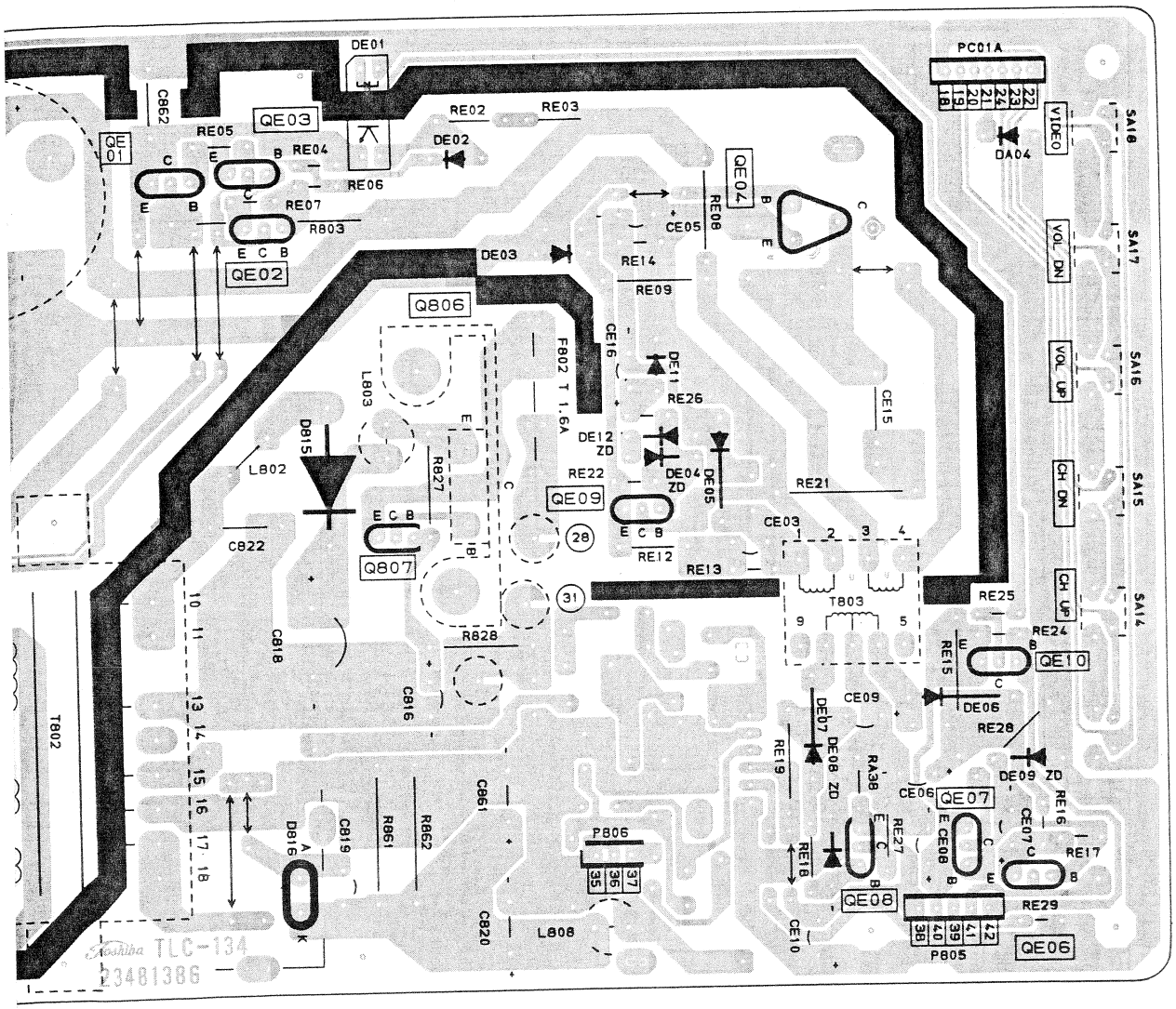


IR-AMP BOARD PW6505
BOTTOM (FOIL) SIDE



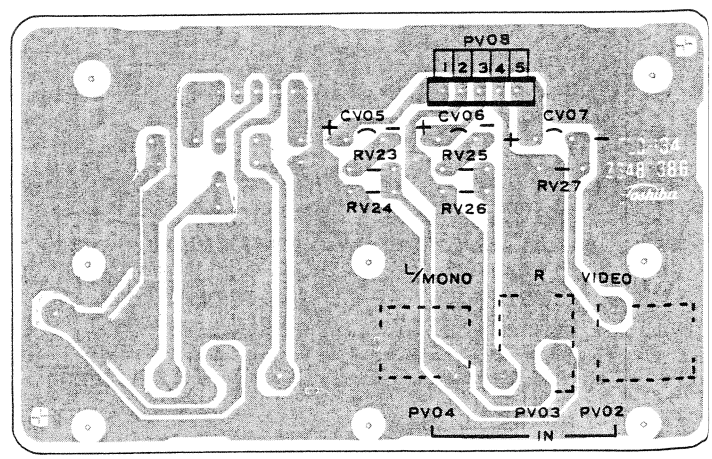
D PW6503-1

L) SIDE



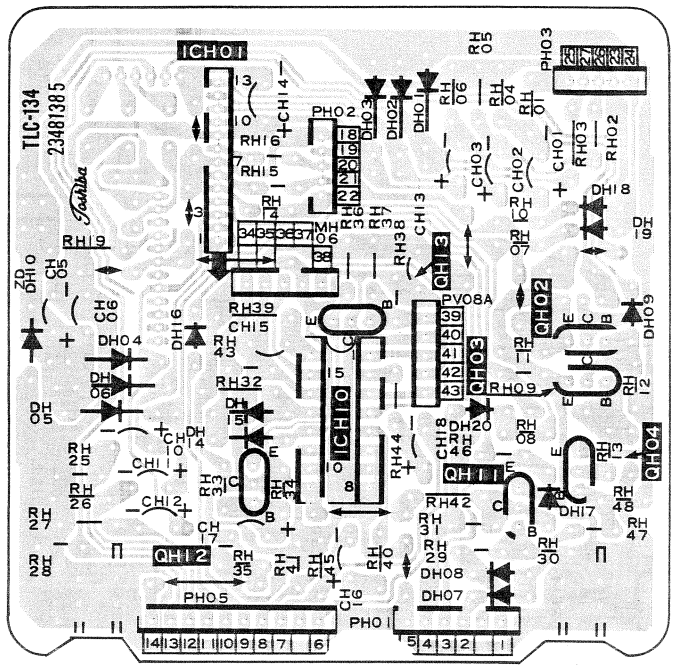
AV/TERMINAL BOARD PW6503-3

BOTTOM (FOIL) SIDE



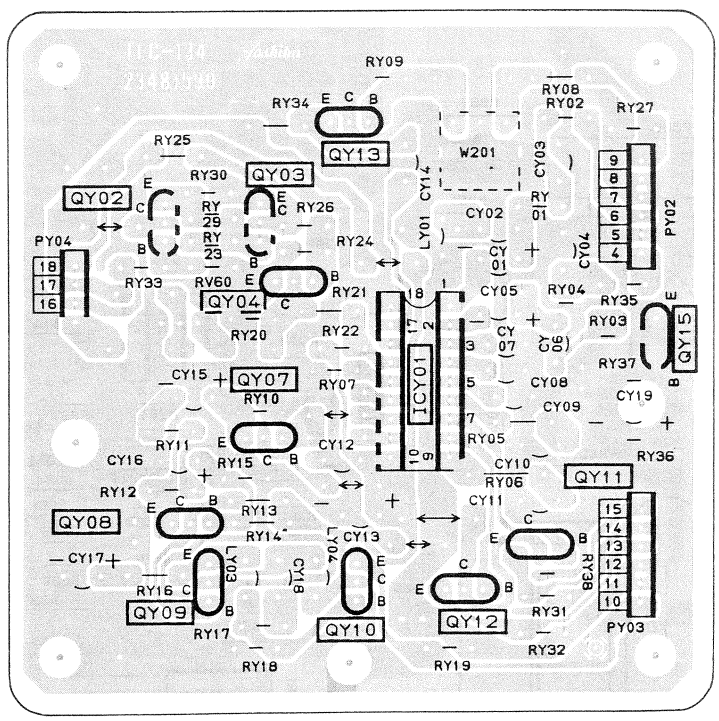
RGB BOARD PW5884

BOTTOM (FOIL) SIDE



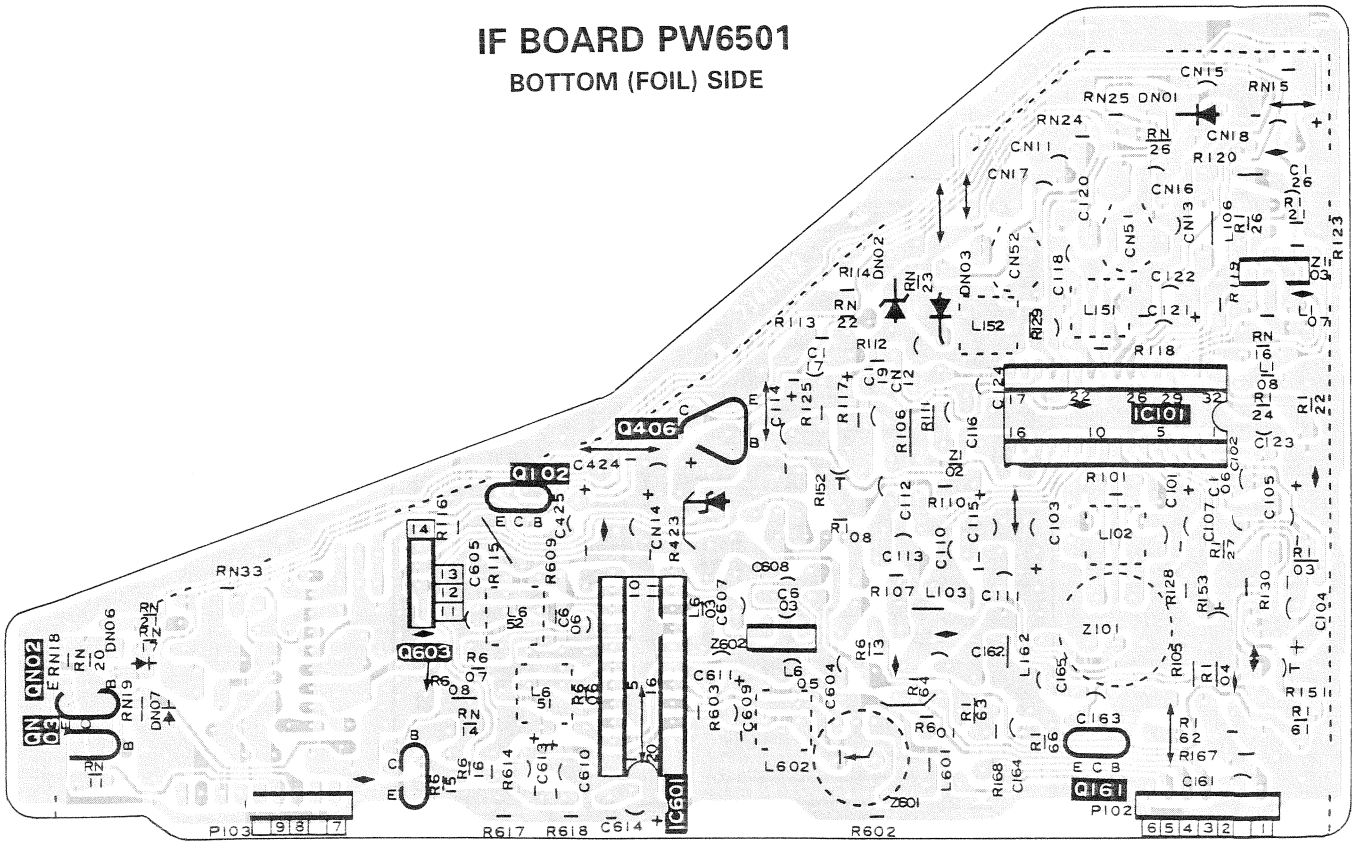
C.T.I. BOARD PW6506

BOTTOM (FOIL) SIDE



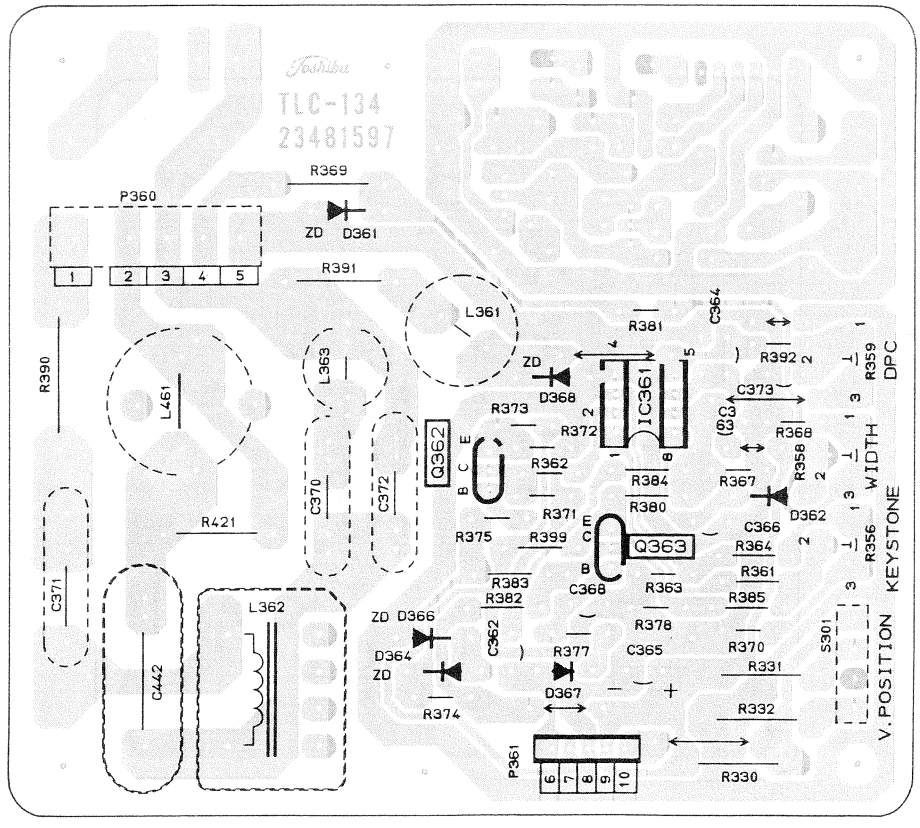
IF BOARD PW6501

BOTTOM (FOIL) SIDE



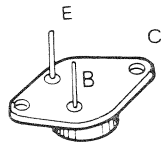
DPC BOARD PW6502

BOTTOM (FOIL) SIDE



TERMINAL VIEW OF TRANSISTOR, etc.

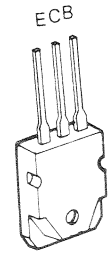
① 2SD1279



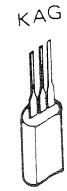
② 2SC2230
2SC2655

③ 2SA1015
2SC388ATM
2SC1815
2SA562TM
2SC1959
2SC1627
2SA950

④ 2SA1265N
2SC3182N

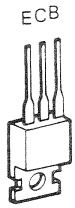


⑤ SFOR1B41

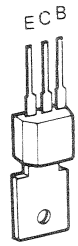


(SCR)

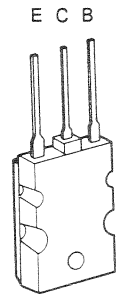
⑥ 2SD553
2SC1569
2SC3148



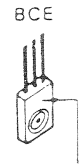
⑦ 2SC2068



⑧ 2SD1432



⑨ 2SC495



MEMO

329R7F

SCHEMATIC DIAGRAM (1/2)

IMPORTANT SAFETY NOTICE

Component marked with the International Hazard Symbol must, if changed, be replaced by an approved type and must be mounted as the original. This will ensure that the safety standards adhered to during manufacture will be maintained following any servicing procedure.

OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltage readings were obtained using a high impedance digital voltmeter.
2. (—) or ground lead of instruments should be connected to the ground marked (⊥) in the shematic on checking Non-isolated circuit surrounded by mark but should be connected to the points marked (⏥) on checking isolated circuit.
3. The voltage readings may vary as much as ±20%.
4. Check that the Tuning, A.F.C., Brightness, Contrast and Colour controls are adjusted for the best picture, making sure that the Contrast,Brightness and Colour controls are set near to their mid-positions.
5. The waveforms were taken using a standard colour bar signal and were observed using a wide band oscilloscope via a low capacity probe.

NOTES:

1. This circuit diagram is subject to change without notice.

EXPRESSION

VALUE OF RESISTOR, CAPACITOR and INDUCTOR

1. Resistance is shown in ohm, k=1,000, M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH, and the values less than 1 in H.

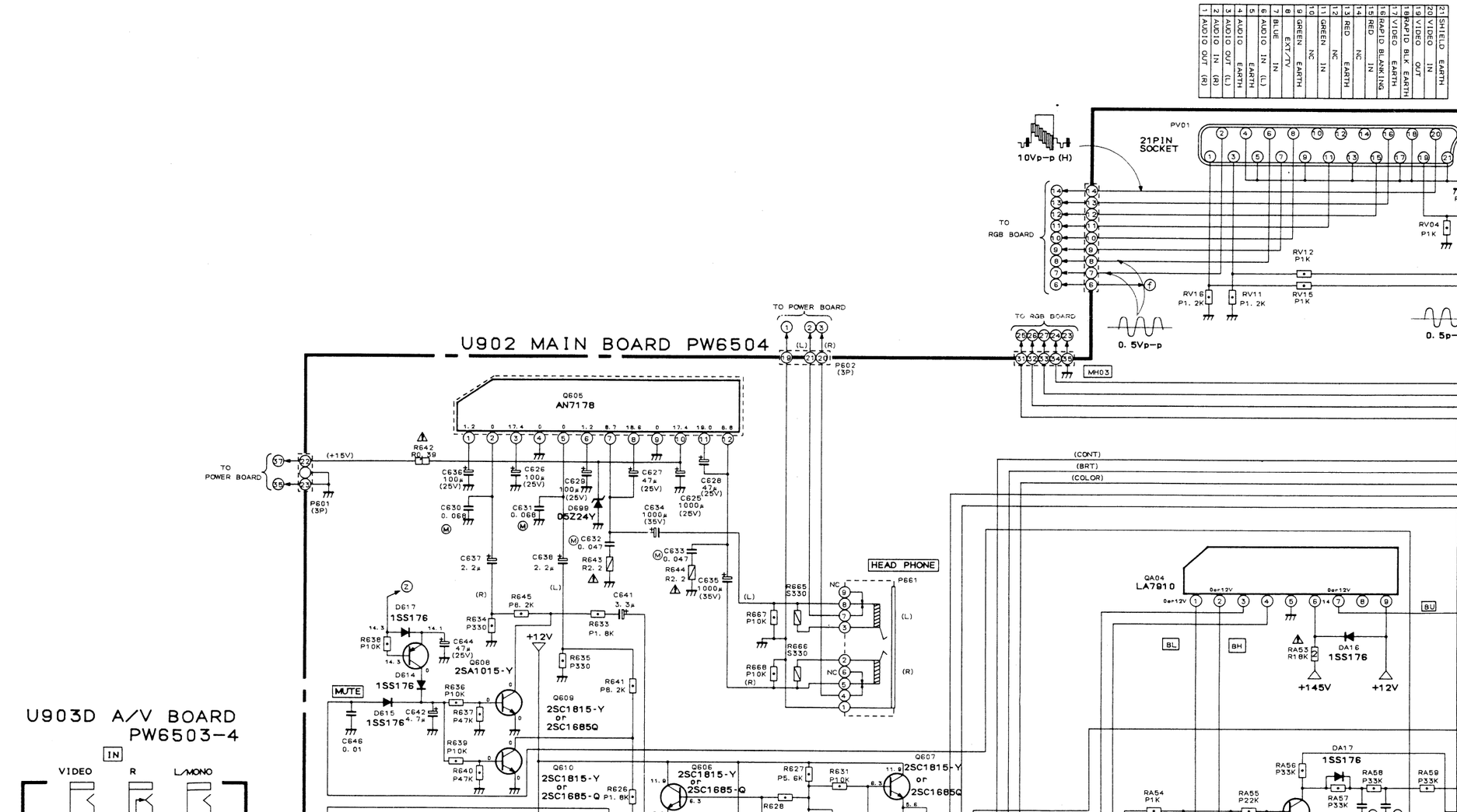
GROUNDING SYMBOL

1. ⊥: Non isolated ground, ⏥ : Isolated ground.

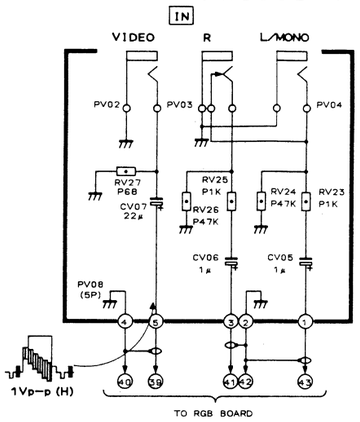
RES

Prefi

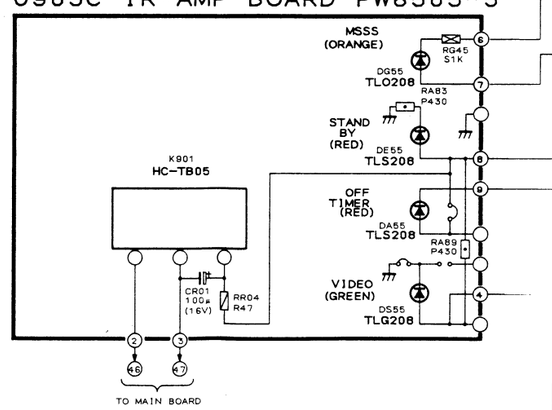
Ce

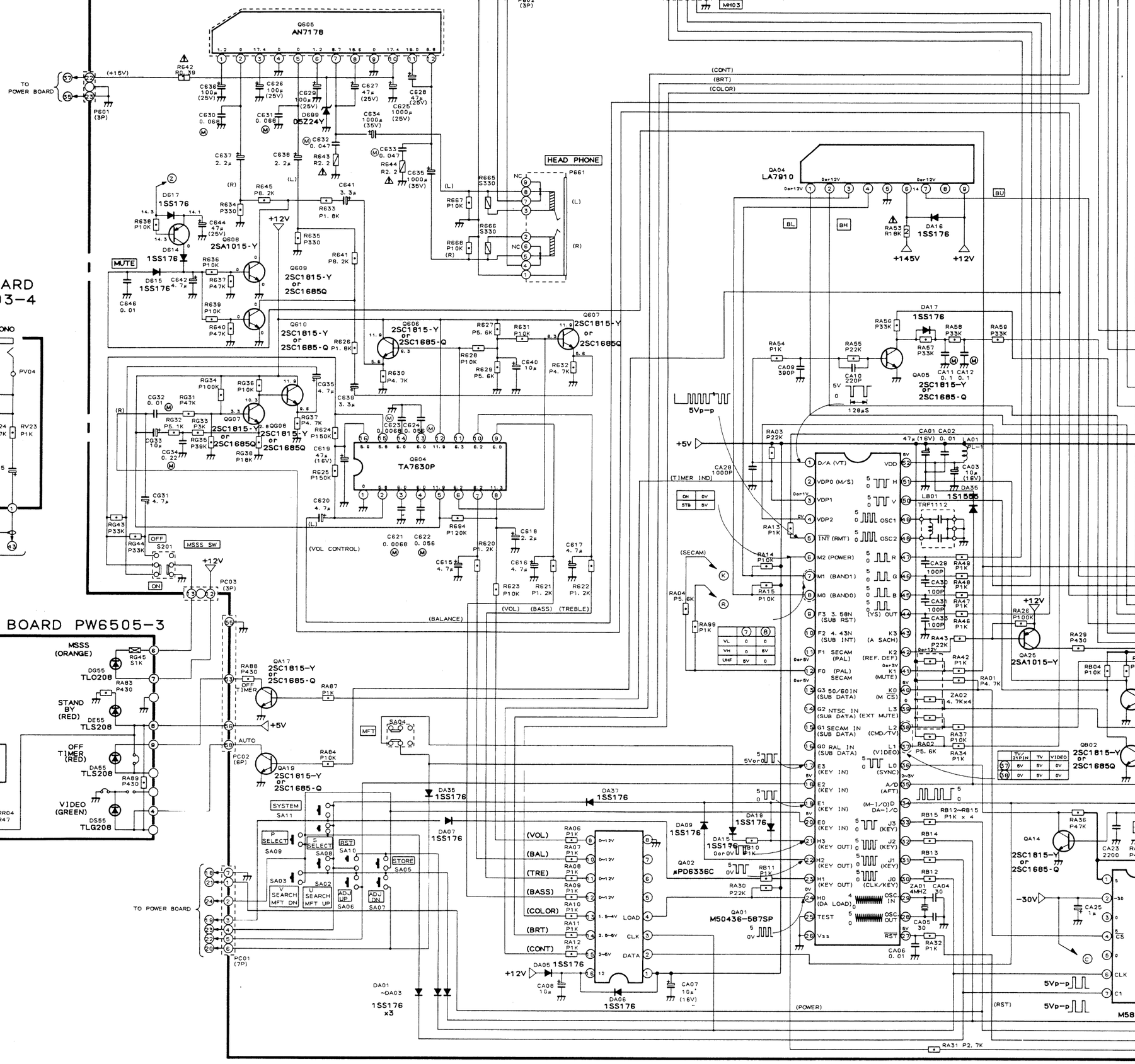


U903D A/V BOARD PW6503-4



U903C IR-AMP BOARD PW6505-3





Y NOTICE

ith the International Hazard Symbol must, if changed, be replaced by an
st be mounted as the original. This will ensure that the safety standards
ıufacture will be maintained following any servicing procedure.

VOLTAGES AND WAVEFORMS

were obtained using a high impedance digital voltmeter.
ıd of instruments should be connected to the ground marked (⊥) in the
king Non-isolated circuit surrounded by mark but should be connected
ked (⏦) on checking isolated circuit.
ngs may vary as much as ±20%.
uning, A.F.C., Brightness, Contrast and Colour controls are adjusted for
making sure that the Contrast, Brightness and Colour controls are set
positions.
were taken using a standard colour bar signal and were observed using a
scope via a low capacity probe.

NOTES:

1. This circuit diagram is subject to change without notice.

EXPRESSION

VALUE OF RESISTOR, CAPACITOR and INDUCTOR

1. Resistance is shown in ohm, k=1,000, M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH, and the values less than 1 in H.

GROUNDING SYMBOL

1. ⊥: Non isolated ground, ⏦ : Isolated ground.

RESISTORS

Prefixed to values:

TYPE	MARK
Carbon Comp.	S
Oxide Metal Film	R
Ins. Carbon Film	P
Wire Wound	W
Cement covered W.W.	NO MARK
Fusible Res.	FR

Suffixes to values:

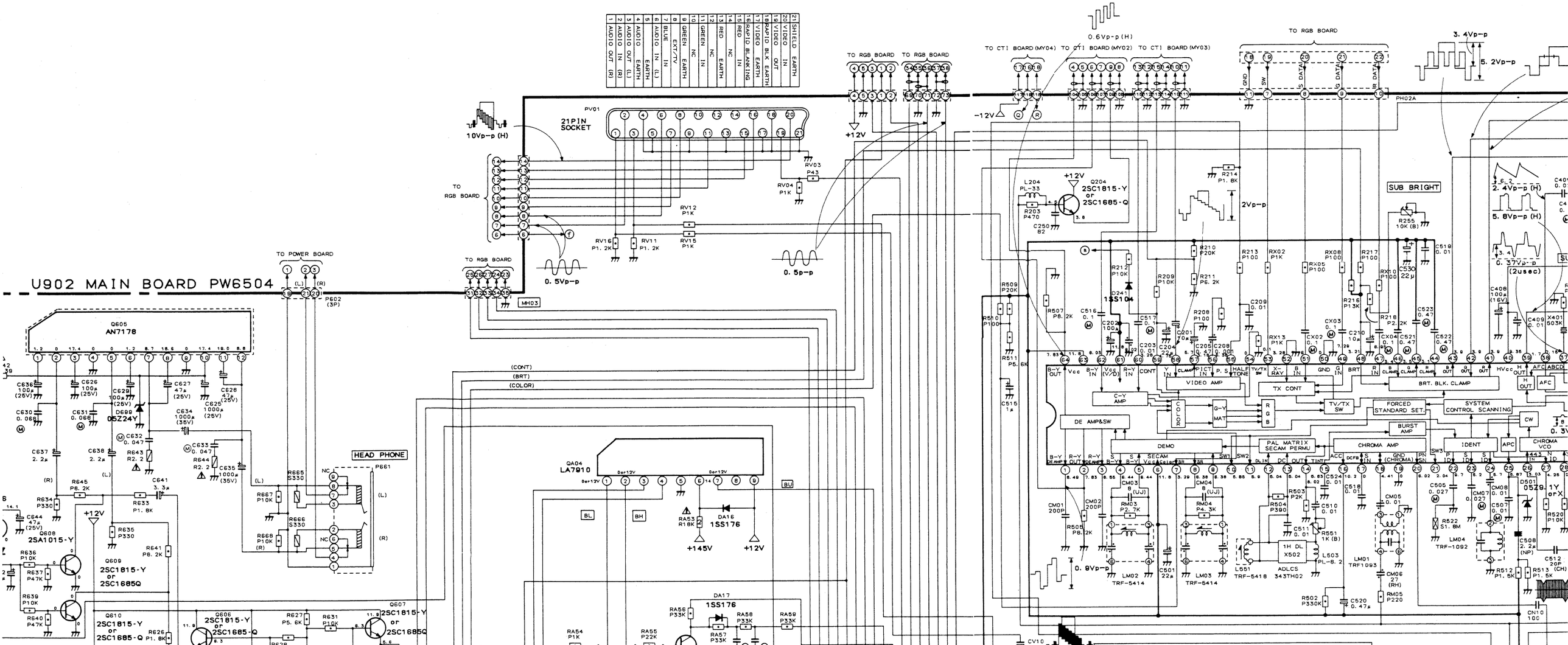
TOLERANCE	MARK
±1%	(F)
±2%	(G)

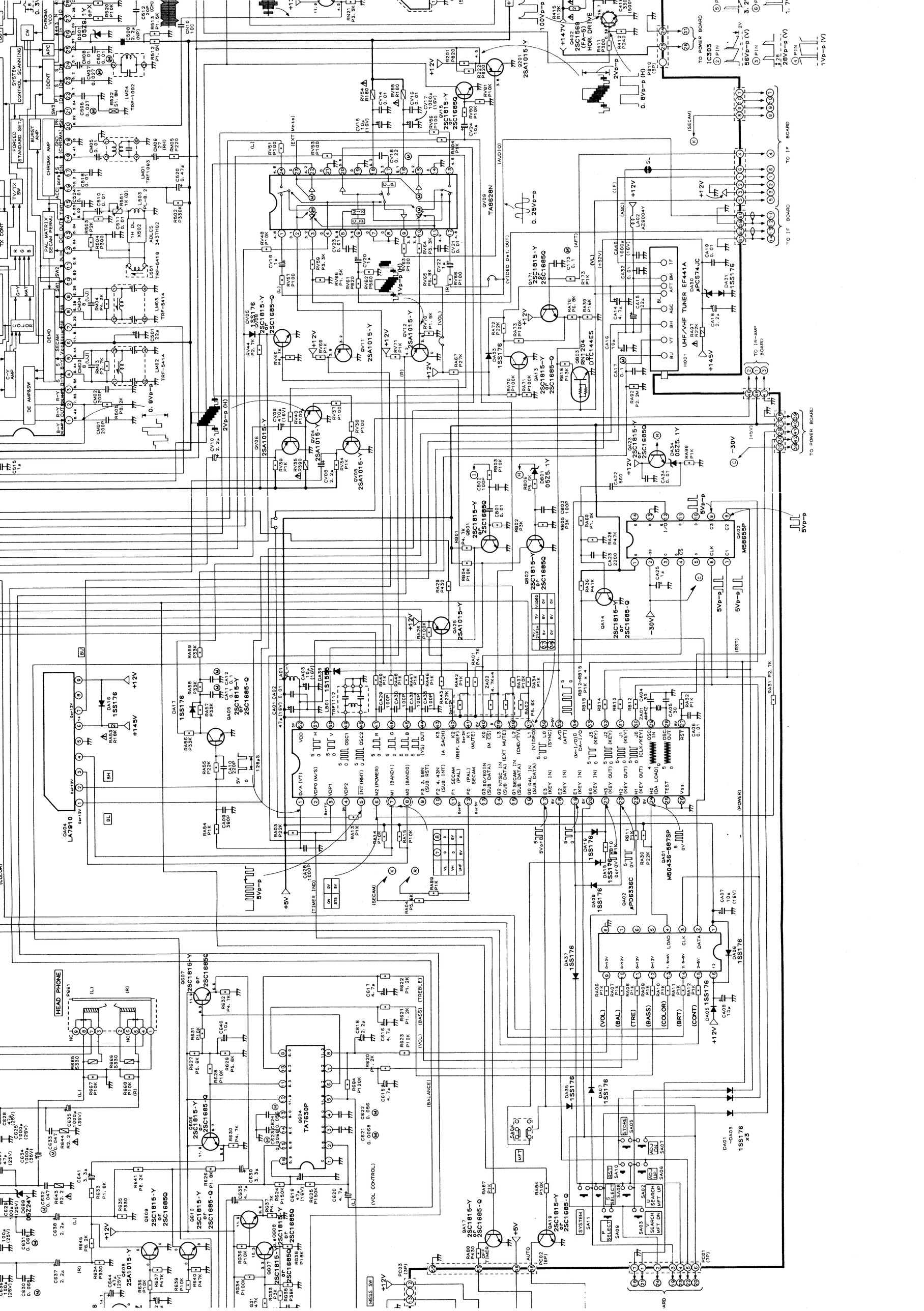
Suffixes to VR values:

LAW	MARK
Linear	(B)
'C' Curve Characteristic	(C)

Rating Markings:

WATTAGE	MARK
1/6W	
1/8 W	
1/4 W	
1/2W	
1W	1
2W	2




UHF/VHF TUNER EF441A
TA8630P
TA8628N
M50436-587SP
μPD6338C
LA7910
M58655P
TO IF BOARD
TO POWER BOARD
TO I/F-AMP BOARD
HEAD PHONE
IC303
SYSTEM CONTROL SCANNING
FORCED STANDARD SET
BURST AMP
CHROMA AMP
PAL MATRIX SECAM PERAL
DEMO
DE AMP&SW
TV/TX SW
IDENT
APC
CHROMA
TX CONT
C-Y AMP
TRF-5418 3437H02
TRF-5414
TRF-1083
TRF-1082
ADL-CS
1H DL
SYSTEM CONTROL
TIMER (NO)
(SECAM)
(AUDIO)
(VIDEO Da1. OUT)
(EXT Mn1e)
(VOL CONTROL)
(BALANCE)
(TREBLE)
(BASS)
(VOL)
(BAL)
(TRE)
(COLOR)
(BRT)
(CONT)
(POWER)
(RST)
MSSS SW
MFT
AUTO
TIMER
STORE
SYSTEM
P SELECT
V SEARCH MFT UP
V SEARCH MFT DN
ADJ LOW
ADJ HIGH
RESET
0. 8Vp-p
2Vp-p (H)
5Vp-p
+12V
+5V
-30V
+145V
0. 25Vp-p
1Vp-p
56Vp-p (V)
28Vp-p (V)
1Vp-p (V)

ARK
S
R
P
W
MARK
FR

Suffixes to values:

TOLERANCE	MARK
±1%	(F)
±2%	(G)

Suffixes to VR values:

LAW	MARK
Linear	(B)
'C' Curve Characteristic	(C)

Rating Markings:

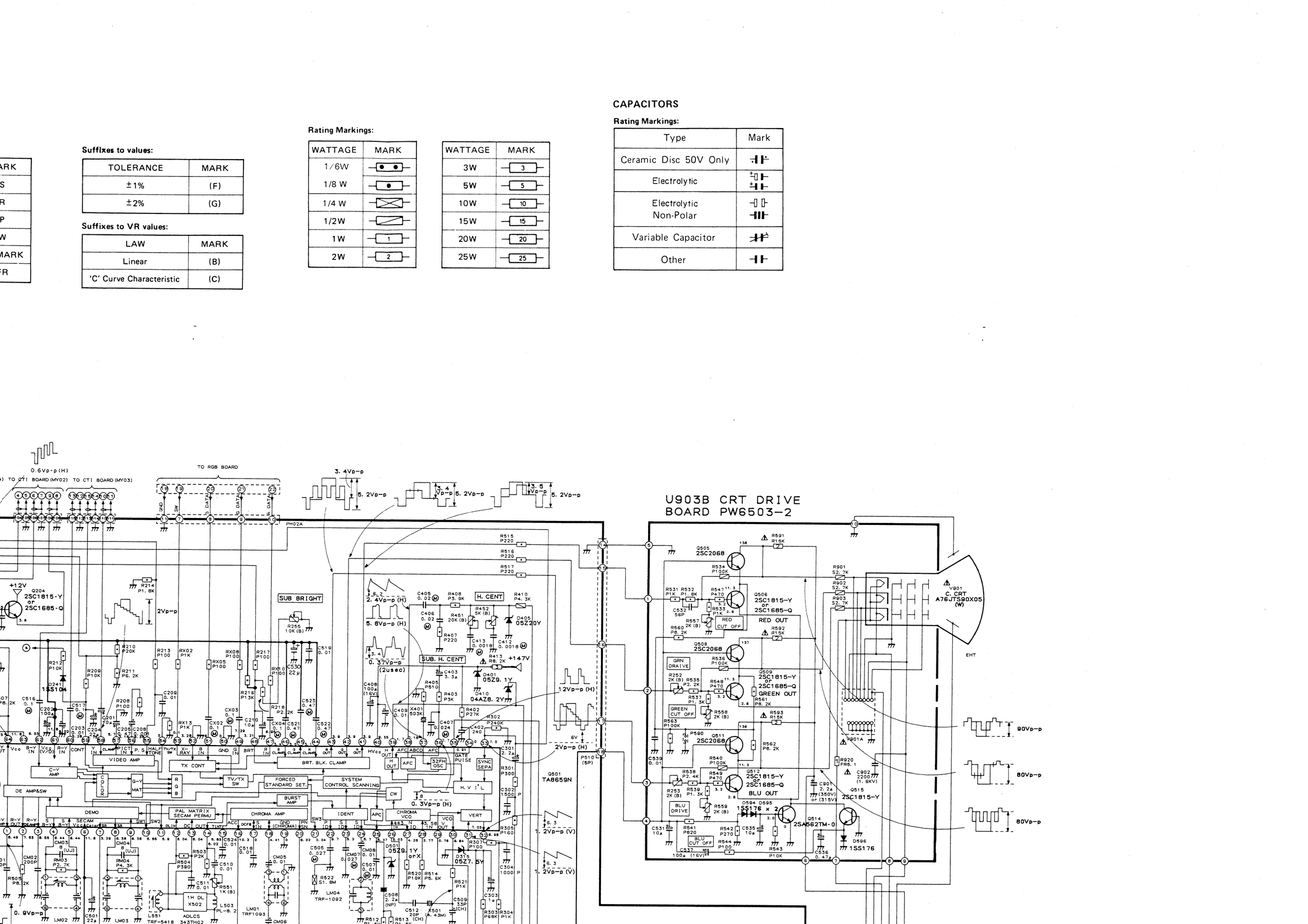
WATTAGE	MARK
1/6W	
1/8 W	
1/4 W	
1/2W	
1W	1
2W	2

WATTAGE	MARK
3W	3
5W	5
10W	10
15W	15
20W	20
25W	25

CAPACITORS

Rating Markings:

Type	Mark
Ceramic Disc 50V Only	
Electrolytic	
Electrolytic Non-Polar	
Variable Capacitor	
Other	



U301 DPC. BOARD
PW6502

329R7F

SCHEMATIC DIAGRAM (2/2)

IMPORTANT SAFETY NOTICE

Component marked with the International Hazard Symbol must, if changed, be replaced by an approved type and must be mounted as the original. This will ensure that the safety standards adhered to during manufacture will be maintained following any servicing procedure.

OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltage readings were obtained using a high impedance digital voltmeter.
2. (—) or ground lead of instruments should be connected to the ground marked (⊥) in the shematic on checking Non-isolated circuit surrounded by mark but should be connected to the points marked (⏚) on checking isolated circuit.
3. The voltage readings may vary as much as ±20%.
4. Check that the Tuning, A.F.C., Brightness, Contrast and Colour controls are adjusted for the best picture, making sure that the Contrast,Brightness and Colour controls are set near to their mid-positions.
5. The waveforms were taken using a standard colour bar signal and were observed using a wide band oscilloscope via a low capacity probe.

NOTES:

1. This circuit diagram is subject to change without notice.

EXPRESSION

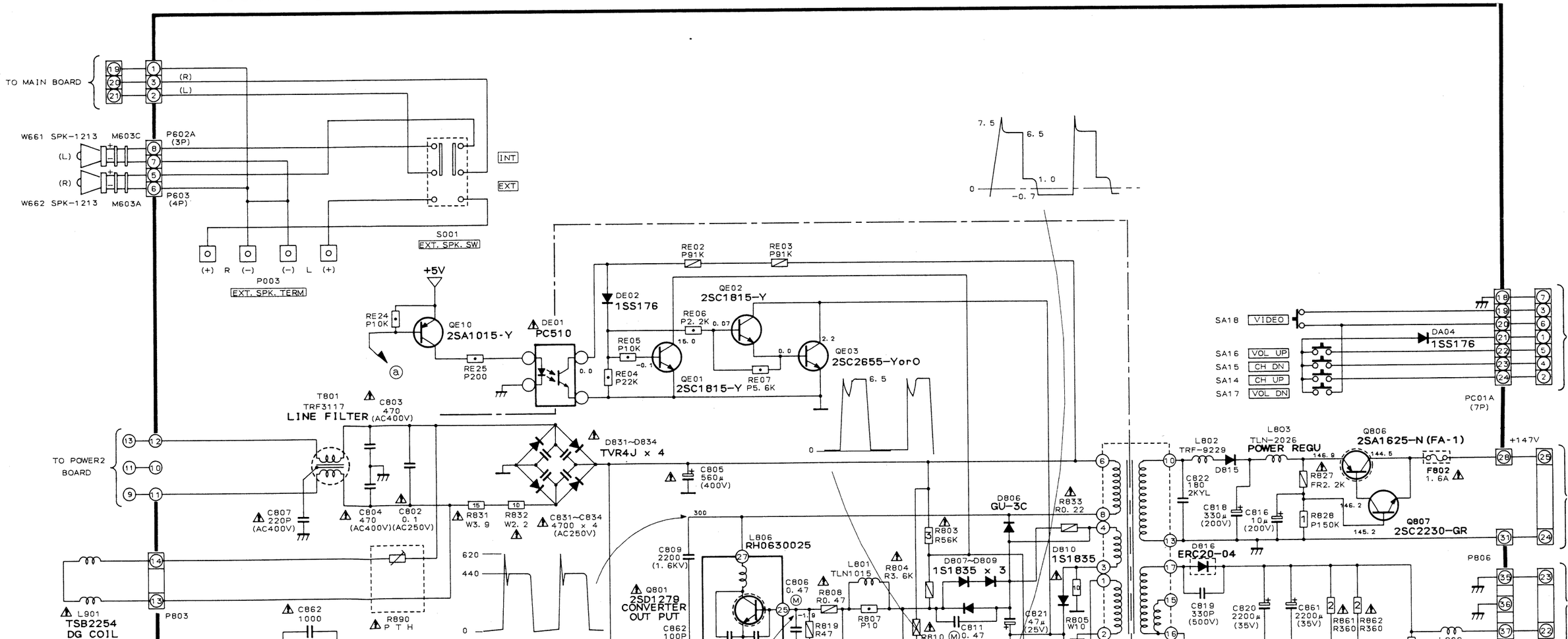
VALUE OF RESISTOR, CAPACITOR and INDUCTOR

1. Resistance is shown in ohm, k=1,000, M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH, and the values less than 1 in H.

GROUNDING SYMBOL

1. ⊥: Non isolated ground, ⏚ : Isolated ground.

U903A POWER BOARD PW6503-1



POWER2 BOARD PW5969

NOTICE

:h the International Hazard Symbol must, if changed, be replaced by an
t be mounted as the original. This will ensure that the safety standards
ufacture will be maintained following any servicing procedure.

VOLTAGES AND WAVEFORMS

vere obtained using a high impedance digital voltmeter.
d of instruments should be connected to the ground marked (⊥) in the
:ing Non-isolated circuit surrounded by mark but should be connected
:ed (⏚) on checking isolated circuit.
gs may vary as much as ±20%.
ining, A.F.C., Brightness, Contrast and Colour controls are adjusted for
making sure that the Contrast, Brightness and Colour controls are set
positions.
ere taken using a standard colour bar signal and were observed using a
cope via a low capacity probe.

NOTES:

1. This circuit diagram is subject to change without notice.

EXPRESSION

VALUE OF RESISTOR, CAPACITOR and INDUCTOR

1. Resistance is shown in ohm, k=1,000, M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH, and the values less than 1 in H.

GROUNDING SYMBOL

1. ⊥: Non isolated ground, ⏚ : Isolated ground.

RESISTORS

Prefixed to values:

TYPE	MARK
Carbon Comp.	S
Oxide Metal Film	R
Ins. Carbon Film	P
Wire Wound	W
Cement covered W.W.	NO MARK
Fusible Res.	FR

Suffixes to values:

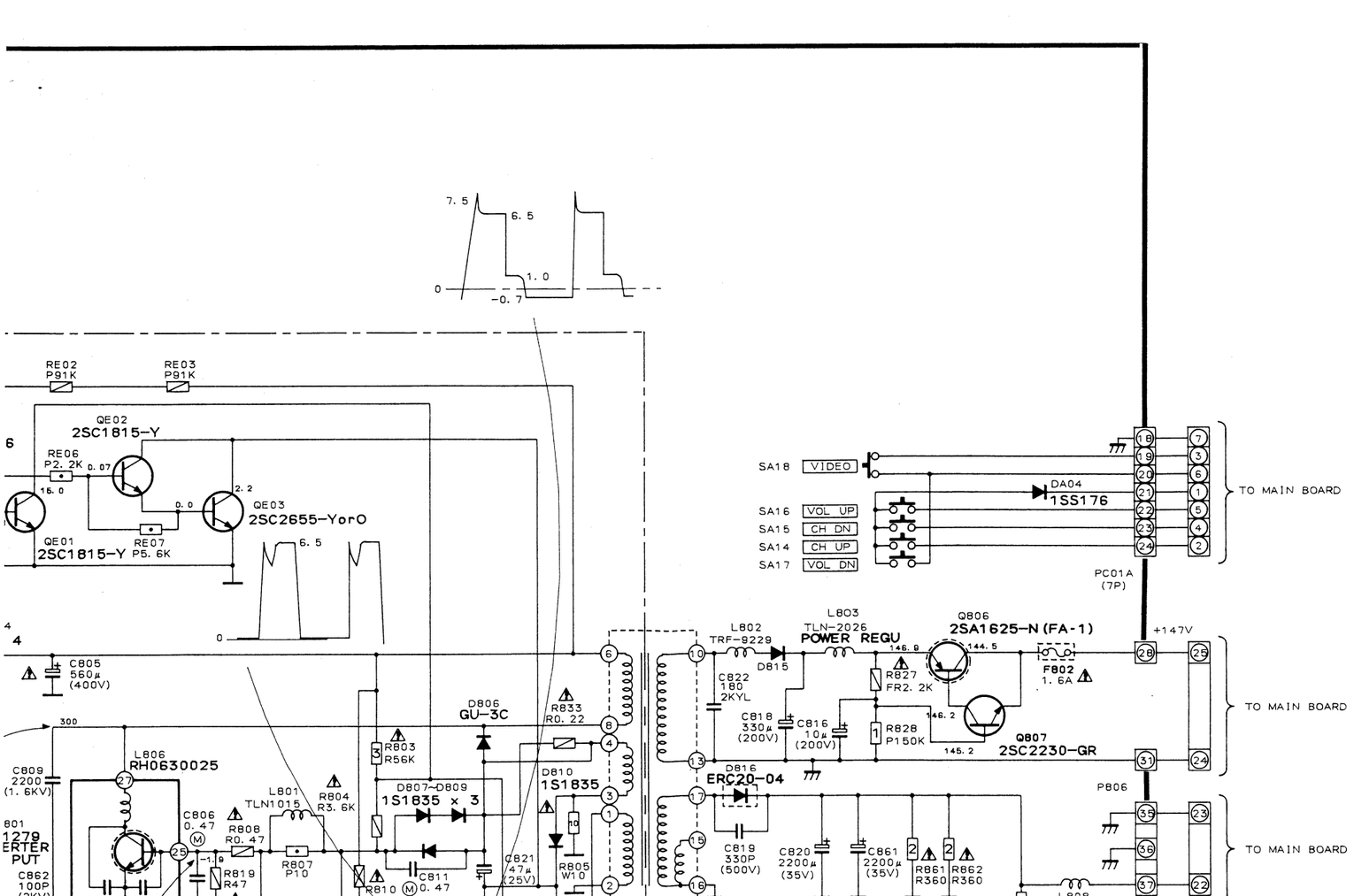
TOLERANCE	MARK
±1%	(F)
±2%	(G)

Suffixes to VR values:

LAW	MARK
Linear	(B)
'C' Curve Characteristic	(C)

Rating Markings:

WATTAGE	MARK
1/6W	
1/8 W	
1/4 W	
1/2W	
1W	1
2W	2



C805 560μ (400V)
C809 2200 (1.6KV)
C862 100P (2KV)
D805 1S1835
L807 TRF9229
L806 RH0630025
C806 0.47
R808 R0.47
L801 TLN1015
R804 R3.6K
R807 P10
R819 R47
R809 P360
C863 1000P (B)
D804 S5295J
D807~D809 1S1835 × 3
R803 R56K
R810 R160K (F)
R811 R180K (F)
C811 0.47
R806 P360
Q802 2SA1012-Y or O OSC-2
Q803 2SC1959-O OSC-1
R833 R0.22
D806 GU-3C
D810 1S1835
R805 W10
C821 47μ (25V)
D820 1SS178
T802 TPW3092 CONVERTER TRANS
L802 TRF-9229
L803 TLN-2026 POWER REGU
D815
C822 180 2KYL
C818 330μ (200V)
C816 10μ (200V)
R827 FR2.2K
R828 P150K
Q806 2SA1625-N (FA-1)
Q807 2SC2230-GR
F802 1.6A
D816 ERC20-04
C819 330P (500V)
C820 2200μ (35V)
C861 2200μ (35V)
R861 R360
R862 R360
R865 R620
L808 TLN2026
P806
+147V
+15V AUDIO)
TO MAIN BOARD
TO MAIN BOARD
P104 (4P) (AUDIO) (AFT)
TO MAIN BOARD
(VIDEO)
D814 04AZ8.2X
C815 4.7μ
R817 R1K (G)
C814 0.001
R851 500 (B)
+147V ADJ
R815 P6.2K
R818 R2K (F)
Q804 2SA1015-Y ERROR AMP
R816 P1.1K
C812 1μ
R820 FR22
D811 S5295G
R812 R2K
R813 P39K
D813 1SS176
C813 0.0024
R814 R560 (F)
D812 1SS176
R823 P10
C826 47μ
R825 P1K
D822 04AZ6.2X
C825 0.03 (M)
Q805 SFOR1B41 O.V.P.
R824 P4.7K
DE06 S5295G
RE15 R33
QE07 2SA950-Y
RE16 P820
CE07 330μ (16V)
CE08 10μ (16V)
QE06 2SA1015-Y
RE17 P220
CE06 470μ (35V)
RE28 R27
DE09 04AZ4.7X
RE27 R1K
DE08 RD30ES-B4
CE09 47μ
RE18 P4.7K
CE10 10μ
RE19 R510
QE08 2SC1627-Y
DE07 S5295G
RE12 R390
RE13 P1.8K
CE03 0.01 (M)
DE05 S5295G
RE22 P680
RE14 P2.2K
DE04 DE12
CE05 10μ
RE26 P560
DE11 1SS176
CE16 2.2μ
T803 TPW3093
RE09 P220K
RA38 P100K
(+5V)
(RST)
(EARTH)
(-30V)
(RMT)
P805
TO MAIN BOARD

U501 RGB BOARD PW5884

QH01 AN5862K
+12V
DH17 1SS176
QH11 2SC1815-Y or 2SC1685Q
RH31 P27K
RH29 P27K
RH30 P22K
RH37 P6.8K
RH36 P2.7K
RH33 P6.8K
RH32 P2.7K
QH12 2SA1015-Y
RH35 P68
RH34 P1.2K
CH17 22μ
QH13 2SA1015-Y
RH38 P1.2K
RH39 R220
CH15 0.01
CH14 100μ (16V)
CH13 0.01
DH14 1S2186 FA-1
DH15 1S2186 FA-1
CH16 2.2μ
CH18 2.2μ
RH44 P1K
RH45 P4.7K
RH43 P6.8K
RH40 P1K
RH41 P4.7K
RH42 P56K
QH10 TC4053BP
RH46 P10K
DH16 1SS176
1Vp-p (H) 1VDC
0.5Vp-p 0.5Vp-p
CH10~CH12 1μ×3
RH25~RH27 P75×3
0.7Vp-p (H) 0VDC
RH28 P82
RH48 P15K
RH47 P39K
DH04~DH06 0A91×3
DH07 1SS176
DH08 1SS176
DH01~DH03 0A91×3
CH01 1μ
CH02 1μ
CH03 1μ
RH04 P820
RH03 P3.9K
RH02 P3.9K
RH01 P3.9K
RH05 P820
TO MAIN BOARD
(VIDEO)
(R)
(L)
(Sw)
(G)
(B)
MH06 (5P)
PH05 (6P)
PV08A (5P)
PH01 (5P)
TO MAIN BOARD
TO A/V TERM BOARD
TO MAIN BOARD

	MARK
p.	S
Film	R
Film	P
d	W
W.W.	NO MARK
s.	FR

Suffixes to values:

TOLERANCE	MARK
±1%	(F)
±2%	(G)

Suffixes to VR values:

LAW	MARK
Linear	(B)
'C' Curve Characteristic	(C)

Rating Markings:

WATTAGE	MARK
1/6W	
1/8 W	
1/4 W	
1/2W	
1W	1
2W	2

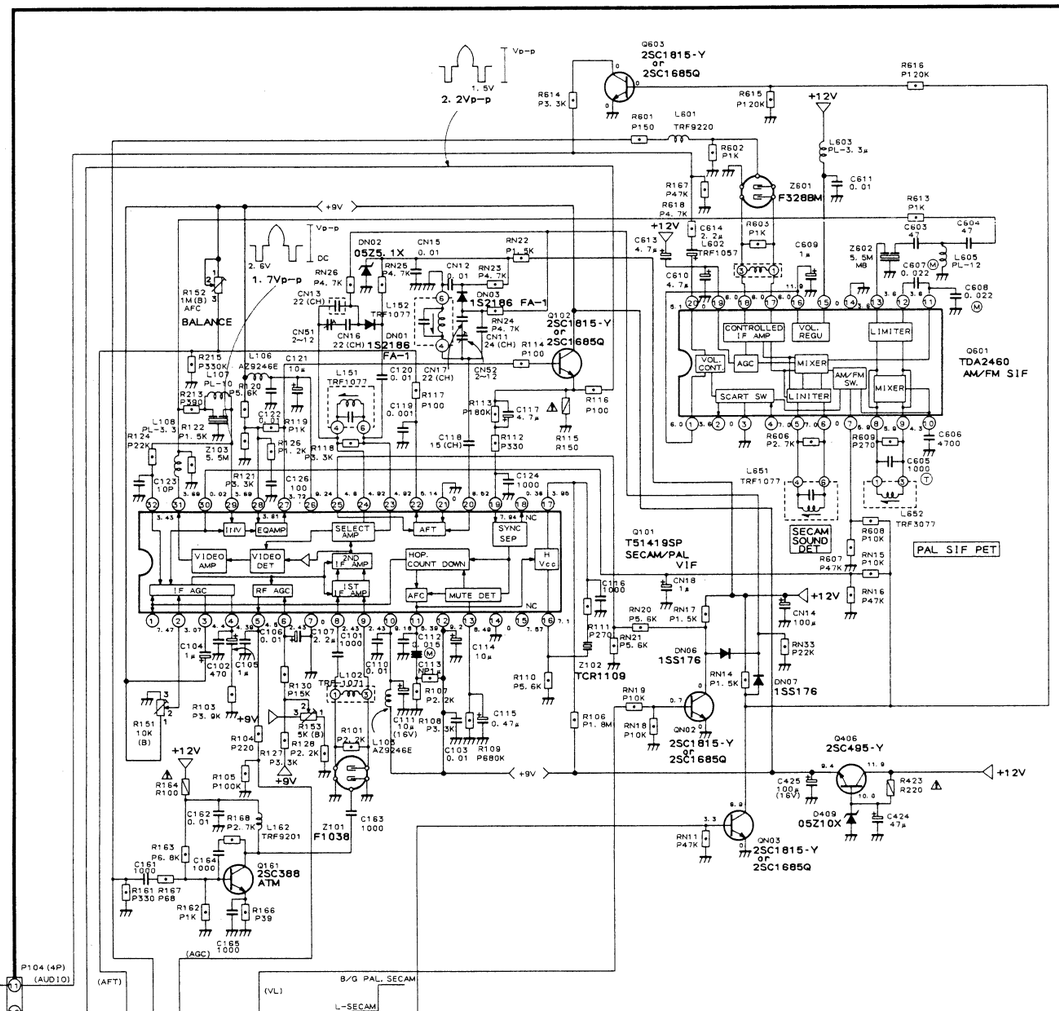
WATTAGE	MARK
3W	3
5W	5
10W	10
15W	15
20W	20
25W	25

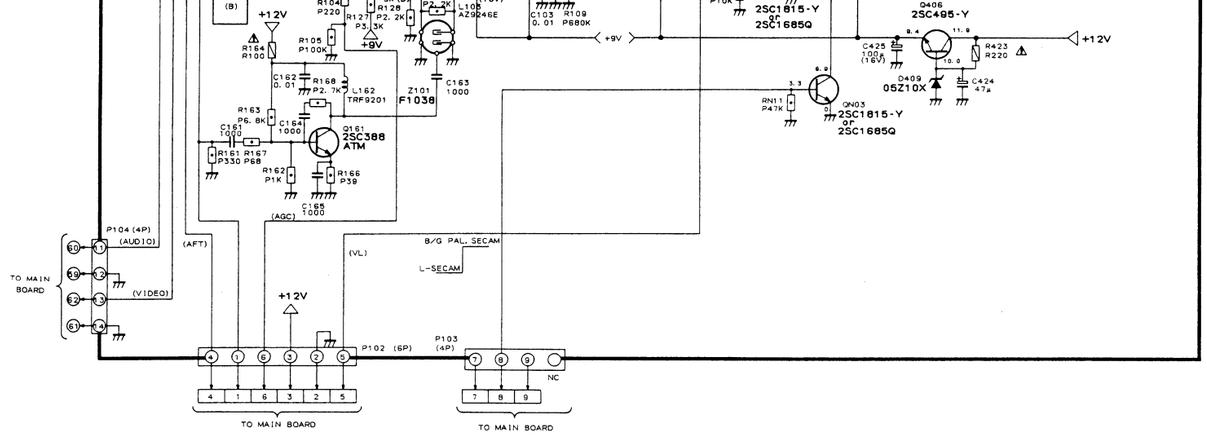
CAPACITORS

Rating Markings:

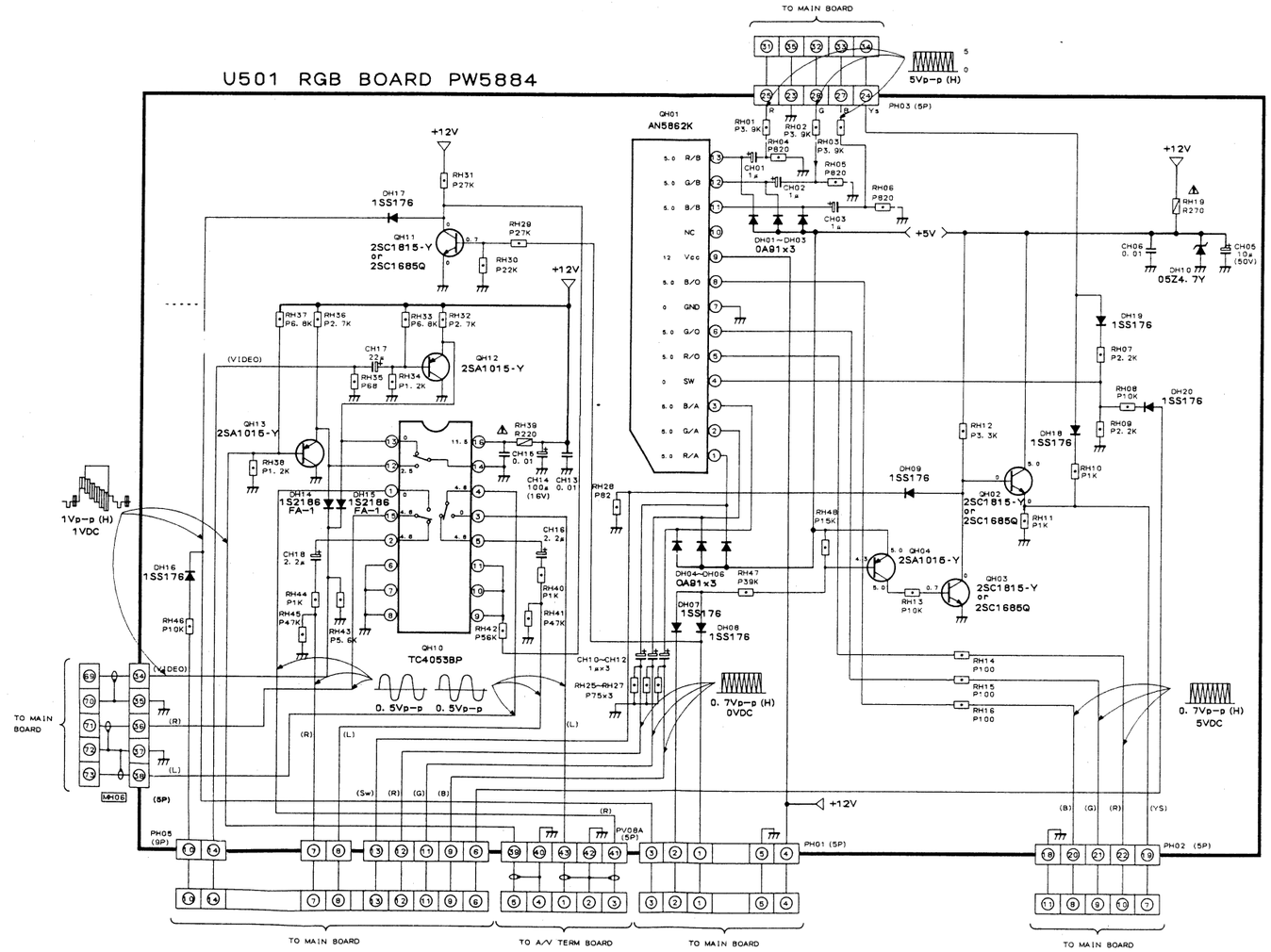
Type	Mark
Ceramic Disc 50V Only	
Electrolytic	
Electrolytic Non-Polar	
Variable Capacitor	
Other	

U101 IF BOARD PW6501





U501 RGB BOARD PW5884



UY01 C. T. I. BOARD PW6506